

## SUBJECT INDEX

SUBJECTS

- Accounting; accounts, standard classification of, 1763  
administration, water and sewerage jointly, 1957  
consumers, and collection, 1769  
retirement units, standard list of, 1763  
physical property records, 517  
Activated carbon; effect in coagulation, 70  
uniform basis for comparison of, 1931  
Administration; independence of water utility, 2109  
small water department, 2114  
Air chambers; *see* Water hammer  
Air-trapped mains; experiences with, 951  
Akron, Ohio; waste, leakage and metering, 220  
Wheeler filter bottoms, 1121  
Algae; *see also* Treatment  
description and illustrations of, 550  
developments in control of, 542  
in reservoirs, 1794  
removal by flocculation, 1695  
toxic effect on animal life, 551, 796  
Alkalinity; effect in coagulation, 68  
graphical determination of, form of, 51  
Allegheny River, pollution and control, 434  
Alum, *see also* Coagulation  
effect of, on fish, 776  
Amebic dysentery; *see also* Disease  
water-borne, 235  
American Water Works Association; committee reports  
chemical hazards, III, SO<sub>2</sub> and NaOH, 489  
grounding, Am. research committee on, 1471  
joint water and sewer billing, 1957  
national water policy, 459  
on work of all water works practice subcommittees, 481  
typhoid in Minneapolis and gastro-enteritis in Milwaukee, 374  
water works practice, 481  
membership, statement of, 574  
report of audit of association funds for '38, 570  
report of 1939 convention and section meetings, 2195  
specifications, *see also* Manual for computation of strength and thickness of cast iron pipe  
cast iron pit cast pipe, a section of the December issue  
cement-mortar lining for cast iron pipe, a section of the December issue  
gate valves, 502  
Ammonia; *see also* Chloramination  
anhydrous, and filter results, 1043  
residual, determination of, with chloramine, 1197  
Analysis; *see also* Bacteriological, Water quality  
British bacteriological methods, 1226  
for residual ammonia with chloramine, 1197  
simplified method for bacteriological, 707  
standard methods for, corrections in, 1935  
Appraisal; *see* Valuation  
Asbestos-cement pipe; Australian practices with, 1298  
Australian practice; pipe coating, electric drainage and grounding, 1290  
Automatic controls; in water works, 87, 1036  
water level recorder for wells, 200  
Bacillary dysentery; *see also* Disease  
water-borne, 237  
Bacteria; corrosion and red water, 1186  
from chlorinated waters, 1511  
Bacteriological; *see also* Media, coliform organisms  
adequacy of methods, 272, 383  
examination of water, simplified method, 707  
methods of analysis, British, 1226  
Baltimore; regulations for extension of mains, 2047  
Beaver river; and effects of Pymatuning reservoir, 419

- Billing; *see also* Public relations  
 at Cincinnati, 1770  
 customer, public relations, 1135  
 water and sewer jointly, 1957  
 Book reviews; *see* Publications, new  
 Boulder dam; *see* Hoover dam  
 British; bacteriological methods of  
 analysis, review of report No. 71,  
 1226  
 grounding regulations, 47  
 labor experiences, 1284  
 Ministry of Health circulars on  
 water supply safety, 1215, 1218  
 Bronze welding; valve seats, 2157  
 Budget planning; municipal water  
 works, 1263  
 Buffalo, N. Y.; pollution from, in the  
 Niagara river, 1156  
 Buildings; regulations for water  
 treatment in, 81
- California; boundary and water prob-  
 lems, 1  
 Metropolitan Water District of  
 Southern, 29  
 Canada; valuation of water works in,  
 1361  
 Carbon; *see* Activated carbon  
 Carbon dioxide; and mineral content  
 correlated with corrosivity, 1909  
 determination graphically, 51  
 Cast iron; *see* Pipe  
 Cathodic protection; Australian ex-  
 periences, 1295  
 Calking of mains; bacterial effect of,  
 833  
 new type of rubber for, 835  
 Caustic soda; safe handling of, 489  
 Cement lining; *see* Coatings  
 Chemicals; effect of, on fish, 776  
 regulation of use of, in building  
 water treatment, 81  
 storage and feeding of, 1038  
 Chemical hazards committee report,  
 III, on  $\text{SO}_2$  and  $\text{NaOH}$ , 489  
 Chile; water and sewage works in,  
 1949  
 Chloramination; as aid to filter opera-  
 tion, 1043  
 determining residual ammonia  
 with, 1197  
 Chlorinated water; bacteria from,  
 1511  
 electro-chemical properties of, 1524  
 measuring bactericidal effect of,  
 1530  
 Chlorination; *see also* Treatment  
 adequacy of, 383  
 de-, methods of, 1541  
 demand determination, 549  
 inadequate, cause of water-borne  
 outbreaks, 248  
 intentional taste from, 544  
 super-, practice in North America,  
 1539  
 Tyler, Texas, experience, 2121  
 Chlorine; definition of available, 2135  
 determination by iodide technic,  
 1723  
 effect of, on fish, 789  
 heavy doses on divers waters, 2121  
 test for residual, 1524  
 Cincinnati, Ohio; billing and collec-  
 tion; 1770  
 Cleveland, Ohio; sewer rental  
 charges, 1964  
 Coagulation; factors in, 67  
 features in, 1387  
 fundamentals in pretreatment, 1691  
 of soft waters with iron salts, 1703  
 treatment by, without filtration,  
 1020  
 with sulfur compounds, 1409  
 Coatings; Australian practice, 1290  
 discussed, 1002  
 enamel and cement on Colorado R.  
 aqueduct, 41  
 Coliform organisms; from chlorinated  
 waters, 1511  
 studies of media for, 689  
 Voges-Proskauer and methyl red  
 tests for, 993  
 Collection and consumer accounting,  
 1769  
 Colorado river; aqueduct, map of,  
 22, 30  
 distribution system, 29  
 basin, 9  
 division of waters of, 18  
 studies for re-use of lime in soften-  
 ing of, 640  
 Color removal; *see also* Treatment  
 developments in, 543  
 in reservoirs, 1783  
 with sulfur dioxide, 1404  
 Columbus, Ohio; experiences with  
 softening, 677  
 Committee reports, *see* American  
 Water Works Association  
 Complaints; handling, 526, 536  
 Consumption; changes and forecasts  
 in, 1272  
 N. Y. world's fair, estimated, 194  
 promoting increase of, 105  
 urban domestic water, 2003  
 Copper sulfate; effect of, on fish, 777  
 Copper tubing for service pipe, 1323,  
 1332  
 Corporation cocks; improved, 117

- Corrosion; *see also* Coatings  
by water correlated with CO<sub>2</sub> and mineral content, 1909  
inspection of, on pipe, 1451  
mechanism of, 1922  
of well screens, 946  
related to bacteria and red water, 1186  
sodium hexametaphosphate preventive, 1183  
theories, developments in, 546  
treatment to prevent in buildings, 81
- Cost of water; wholesale, 1096
- Crenothrix; *see also* Iron  
action of, 79  
occurrence of, 101
- Cross-connections; *see also* Plumbing hazards  
cause of water-borne outbreaks, 248  
elimination of, in Nashville, Tenn., 977  
ordinance on, 985  
Washington, D. C., 77
- Customer relations, *see* Public relations
- Cyanides; determining small quantities of, 798  
effect of, on fish, 780
- Dams; earth, design and maintenance of, 1335
- Damages; from water-borne illness, 270, 962  
legal liability for, from leaks, 955
- Depreciation; *see also* Accounting, Valuation  
comments on report on, 837  
of mains, 1625  
of property, 519
- Des Moines, Iowa; water supply and iron problem, 96
- Disease; *see also* Amebic dysentery, Bacillary dysentery, Dysentery, Gastro-enteritis, Jaundice, Plumbing Hazards, Typhoid  
discussion of, and water quality standards, 1475  
hazards of, 1143  
legal liability for, 270  
water-borne in U. S. and Canada, 225, 1490
- Distribution system; *see also* Pipe, Mains, Reservoir  
design for fire protection, 2037  
planning, 2079  
regulation of extensions to, 2047
- Droughts, effect on fish, 771
- Dust removal; from flue gas for recarbonation, 1201
- Dysentery; *see also* Amebic and Bacillary, Disease  
definitions and discussions, 1489  
statistics tabulated, 284
- Earth dams; design and maintenance of, 1335
- East Orange, N. J.; ground water replenishment works, 165
- Earthing; *see* Grounding
- Electric; *see also* Grounding  
drainage and grounding practice in Australia, 1294  
equipment, maintenance of, 2085
- Electro-chemical properties of chlorinated water, 1524
- Electrolysis; Australian experiences, 1294
- Employees, water works; labor relations among, 1279  
social security for, 1124
- Enamel coatings; *see* Coatings
- Errata, 1225, *opposite* 1084
- Federal; *see also* National  
aid projects in Tacoma water works, 1577  
recovery program, recovering from, 1085  
social security program, 1124  
W.P.A. projects in N. Y. city, 823  
water planning agency, 466, 474
- Filter bottoms (strainer systems); symposium on, 213
- Filtration; *see also* Treatment  
after softening used as means of stabilizing, 1045  
inadequate control of, as cause of disease, 248  
sand, manganese adsorption by, 1714
- Financial budget planning for water works, 1263
- Fire fighting; efficient utilization of water for, 2027
- Fire hydrant, *see* Hydrant
- Fire service; design of distribution system for, 2037  
private, charges for, 2053, 2061
- Fish, effect of various polluting substances on, 771
- Flocculation; *see also* Coagulation, Treatment  
fundamentals of, 1691
- Flood control; *see also* Water resources  
effect on water quality, 419  
and water supply in Pittsburgh district, 434  
dams for, 1356

- Fluorine; in relation to dental caries, 1926  
possible treatment of water with, 1928
- Gas; flue, dust scrubbers for, 1201  
pressure, differential in wells, 2118
- Gastro-enteritis; *see also* Disease  
as a preferred index of water quality, 1145  
in Milwaukee, Wis., 374  
water-borne, 1489
- Gate valves; *see* Valves
- Grounding; *see also* Cathodic protection, Electrolysis  
Australian practice in, 1297  
earth leakage switch for, 1306  
new British regulations on, 47  
report of research committee on, 1471
- Ground water; infiltration gallery at Des Moines, Iowa, 96  
level recording automatically at Long Beach, Calif., 200  
replenishment by E. Orange, N. J., 165
- Hammond, Ind.; laboratory control, operating experiences, 2137
- Hardness of public water supplies, 608
- Health hazards; *see also* Plumbing hazards  
potential, in water distribution, 1143
- Hoover dam; purposes of, 12
- Hydrant; manholes for, 186
- Hydraulics, *see also* Water hammer  
elementary principles, 2073
- Hydrology, *see* Rainfall, Stream-gaging, Weather
- Illinois, University of; experiences with red water, 86
- Imperial valley; irrigation projects, 26
- In-service training for operators, 680
- Industrial use of; Ohio River, 451  
super- and de-chlorination, 1550
- Industrial wastes; effects of, on fish, 791
- Inspection; pipe lines, 1451
- Insulated meter couplings, 118
- Intake construction for Syracuse, N. Y., 759
- International water and boundary problems; with Mexico, 1
- Interstate stream control, 6, 468
- Inventory; of physical property, 518
- Iodide technic; for residual chlorine determination, 1723
- Iron; *see also* Crenothrix, Treatment and manganese in reservoirs, 1790  
bacteria illustrated, 102  
problem at Des Moines, Iowa, 96  
removal, developments in, 545  
salts for coagulation, 1703
- Irrigation; consumers, service to, by water dept., 111  
in the southwest, 1
- Jaundice; *see also* Disease  
water-borne, 237
- Kiskiminitas river; pollution and control, 434
- Labor relations in water works, 1279
- Laboratory control; Hammond, Ind., 2137
- Lead; pipe for services, 1323, 1332  
poisoning, liability for, 1327
- Leaks, classification and control of, 1114  
legal aspects of damage from, 955
- Liability; for kind of service pipe material, 1327  
for leaks from mains, 955  
for water-borne illness, 270, 962
- Licensing of water works operators; practice in New York state, 683  
status in various states, Nov. '39, 1970
- Lime; reclamation of, after use in softening, 640  
use of, with iron in coagulation, 1708
- Linings for pipe, *see* Coatings
- Long Beach, Calif.; automatic ground water level recording, 200
- Los Angeles, Calif., water dept.; gadgets in use by, 114  
promotion of use of water, 105
- Louisville, Ky.; battery meter settings at, 1049
- Mains; *see also* Pipe  
adaptability of materials for, 1002  
air-trapped, experiences with, 951  
bacterial effect of jute, hemp in jointing, 833  
extensions, regulations for, 2047  
inspecting condition of, 1451  
leaks from, liability for, 955  
rubber packing, new, for jointing, 835  
service lives of, 1625  
sterilization of, 832
- Manganese removal; *see also* Treatment  
by adsorption on sand, 1714

- by iron salts, 1713  
developments in, 545  
Manholes; *see also* Meter box  
for hydrants, 186  
Media for coliform organisms; studies  
of, 689  
Melbourne, Australia; practice in  
pipe coating, electric drainage  
and grounding, 1290  
Meter; box covers, 124  
couplings, insulated, 118  
jet, for sewer flushing, 127  
register, lubrication, 121  
rate recording, 129  
seal for, 122  
settings, battery, at Louisville,  
Ky., 1049  
testing at Tacoma, Wash., 1589  
under registration, control of, 1116  
Methane; difficulty with, in treat-  
ment, 1743  
Methyl red and Voges-Proskauer  
tests with the coliform group, 993  
Mexico, boundary and water treaties  
with, 1  
Milwaukee; gastro-enteritis in, 374  
Minneapolis; typhoid in, 374  
Mixing; *see also* Treatment  
as used in softening, 563  
effect in coagulation, 69  
fundamentals of, 1691  
Nashville, Tenn.; elimination of cross  
connections in, 977  
ordinance on cross-connections, 985  
National Assn. of Railroad & Util.  
Comm. depreciation report; com-  
ments on, 837  
National; *see also* Federal  
recovery program, 1085  
resources committee, 474  
water policy, committee report, 459  
Newark, N. J.; wholesale cost of  
water, 1097  
New York city; regulation of water  
treatment in buildings, 81  
W.P.A. projects in, 823  
New York State; requirements for  
qualification of water works  
operators, 683  
water supply statistics, 680  
New York world's fair; water supply,  
190  
Niagara river; bacterial pollution of,  
1156  
Odor, *see* Taste and Odor  
Oklahoma City, Okla.; softening ex-  
perience, 678  
Ohio river; pollution and control, 419,  
434, 451  
water-borne disease outbreaks, 1481  
water systems, 454  
Operators; water works, *see* Licens-  
ing, Schools, Employees  
Outbreaks of disease; water-borne,  
*see* Disease  
Oxygen saturation; effect of, on fish,  
773  
Packing, *see* Calking  
Pennsylvania; watershed yields in,  
133  
pH; effect in coagulation, 68  
use in determination of carbon  
dioxide, 52  
Phenols; effect of, on fish, 779  
for carbon testing, 1933  
Pipe; *see also* Asbestos-cement, Coat-  
ings, Mains, Service pipe  
adaptability of materials for, 1002  
cast iron; compared with other  
materials, 1002  
design, discussion of new law of,  
1655  
new method of determining  
thickness, 841  
service life of, 1625  
coatings discussed, 1002  
concrete, in Colorado river aque-  
duct, 33  
joints, lead, electrical resistance  
of, 1304  
lines, inspecting condition of, 1451  
steel; compared with other ma-  
terials, 1002  
intake construction, 759  
welded, in Colorado river aque-  
duct, 38  
transite, compared with other  
materials, 1002  
Planning; budget for water works,  
1263  
organization of water resources, 462  
property development for water  
works, 1271  
Plumbing hazards; *see also* Cross-con-  
nections  
discussion and tabulation, 987  
discussion of, 1153  
liability for, 962  
preventing and correcting, 969  
Population forecasts, 1273  
Property records; *see also* Deprecia-  
tion, Valuation  
physical, 517  
Publications, new, British; bacteri-  
ological methods, 1226

- water supply safety control circulars, 1215, 1218
- Public relations; complaint handling, 526, 536  
dramatization of, 2018  
helping by speaking, hints, 1315  
importance and improvement of, 1308  
questions and answers on, 1135  
should include supervision of health hazards, 1148  
to promote water use, 105
- Pumps and pumping; automatic control of, 89  
centrifugal; design for underground waters, 1675  
method of testing, 2098  
vertical, applications, 1684
- Purification; *see* Treatment
- Pymatuning reservoir; effects of, 419
- Quality; handling complaints about, 526  
standards of raw and treated, 1479  
symposium on, 1475  
throughout the system, 74
- Rainfall records in Pennsylvania, 133
- Rand Water Board; dust filters for flue gas, 1201
- Rates; *see also* Depreciation, Valuation  
and public relations, questions and answers, 1135  
wholesale, for water, 1096
- Recovery program, 1085
- Recreation; sanitation of areas for, 714  
trailer camp sanitation, 727  
use of reservoirs for, 724
- Red river interstate control plan, 469
- Red water related to bacteria and corrosion, 1186
- Replenishment of ground water, surface diffusion, 165
- Reports of committees; *see* American Water Works Association
- Reservoirs; aging of waters of, 1775  
floating outlets for, 1025  
safety in control of, 1223  
use of for recreation, 724
- Retirement units; standard list of, 1763
- Retirement; *see* Social security
- Rio Grande; tri-state compact, 2  
use of waters of, 6, 470
- Riparian law; as to ownership of river, 478
- River; *see* Stream
- Safety control of water supplies; British circulars on, 1215, 1218
- St. Petersburg, Fla.; softening plant, 1755
- Sanitation; *see* Plumbing hazards  
of recreational areas, 714  
of trailer camps, 727
- Schools; short, and operator qualifications, 680
- Sedimentation; *see* Coagulation
- Service pipe; materials for, 1323, 1332
- Sewer; jet meter for flushing, 127  
rentals; and water, billed jointly, 1957  
experiences in establishing, 1964
- Sewerage; and water works in Chile, 1949  
of recreational areas, 714
- Shenango river; and effects of Pymatuning reservoir, 419
- Shop and store building; Tacoma, Wash., 1586
- Short schools; and operator qualifications, 680
- Slat bottom filters; Washington, D. C., 213
- Small water department management, 2114
- Social security for water works men, 1124
- Sodium; hexametaphosphate treatment of water, 1171  
hydroxide, safe handling of, 489  
silicate, use in treatment, 2149
- Softening; *see also* Treatment  
benefits and savings from municipal, 607  
bibliography on, 635  
effluent, stabilizing of; by deposit on filter sand, 1045  
by threshold treatment, 1171  
history of, 612  
lime; with upward flow clarification, 1734  
-soda, progress in, 558  
recarbonation, dust removal from flue gas for, 1201  
re-use of lime in, 640  
with upward flow basins at St. Petersburg, Fla., 1755
- Southwestern border water problems, 1
- Specifications, *see also* Manual for computation of strength and thickness of cast iron pipe  
cast iron pit cast pipe, a section of the December issue  
cement-mortar lining for cast iron pipe, a section of the December issue  
gate valves, 502



- Speeches; on purification to non-technical audiences, 1315
- Springfield, Mass.; service lines of mains of, 1626
- Standard methods of analysis; connections in, 1945
- Standards of water quality; *see* Water quality
- Steel; *see* Pipe
- Sterilization, *see also* Chlorination, Chlorine  
of water mains, 832  
with sulfuryl chloride, 1402
- Stream control; interstate, 6, 468  
on Shenango and Beaver rivers by Pymatuning reservoir, 419  
gaging in Pennsylvania, 134  
pollution; effect of, on fish, 771  
in Pittsburgh district, 419, 434  
of Niagara river, 1156  
of Ohio river, 451
- Submarine intake construction, 759
- Sulfur; compound in water and waste treatment, 1400  
dioxide; safe handling of, 489  
for filter sand cleaning, 549, 1403
- Swedish labor experiences, 1283
- Syracuse, N. Y.; intake construction for 759
- Tacoma, Wash.; stores and shop building, 1586  
water works construction program, 1575
- Tapping machine; improved, 114
- Taste and odor; *see also* Algae, Treatment  
developments in removal of, 544  
effects of Pymatuning reservoir, 419  
removal by de-chlorination, 1540
- Texas; boundary and water problems, 1
- Threshold treatment, 1171
- Trailer camps; sanitation and water supply of, 727
- Transite pipe, *see* Pipe
- Treatment, water; *see also* Algae, Chemical hazards, Chloramination, Chlorination, Coagulation, Corrosion, Mixing, Softening, Water quality  
automatic control of, 90  
coagulation and sedimentation without filtration, 1020  
developments in, 542  
pretreatment fundamentals, 1691  
regulation of, in N. Y. city buildings, 81  
safety in control of, 1217, 1222  
speaking on, to non-technical audience, 1315  
sulfur compounds in, 1400  
threshold, 1171  
unusual methods and equipment for, 1033
- Tunnels; on Colorado river aqueduct, 32
- Tyler, Texas; super-chlorination at, 2130
- Typhoid; *see also* Disease  
as index of water safety, 1145  
decline since 1900, 227  
in cities of U. S. in 1938, 1561  
in Minneapolis, 374  
statistics tabulated, 278
- United States; *see also* Federal Treasury Dept. water standards, discussion of, 1480  
valuation of water works in, 1379
- Valuation of water works; in Canada, 1361  
in U. S. 1379
- Valves; gate, specifications for, 502  
operation of, to reduce water hammer, 1893  
proper, to control water hammer, 1904  
relief, hydraulics of, 1854  
seats, building by welding, 2157  
wash water, device for control of, 1033
- Voges-Proskauer and methyl red tests; with the coliform group, 993
- Wagner act; experience with, 1282
- Washington, D. C.; slat bottom filters at, 213  
water works, 75
- Wash water valve control; device for, 1033
- Water; *see also* Analysis, Bacteriological  
water hammer; and air chambers in centrifugal pumping, 1865  
control by proper valves, 1904  
instances of, 539  
methods of calculating, 1835  
studies on long pipe lines, 1893  
policy; national, committee report, 459  
quality; handling complaints on, 526  
standards of, raw and treated, 1479  
symposium on, 1475  
resources; organization of planning of, 462  
state ownership theory of, 478

- supply; control of quality of, 74, 106
  - for trailer camps, 727
  - potential health hazards in, 1143
  - safety control of, British circulars, 1215, 1218
  - treatment of in buildings, regulated, 81
- waste, classification and control of, 1110
- works; administration, safety in, 1215, 1218
  - and sewerage in Chile, 1949
  - automatic control in, 87, 1036
  - budget planning for, 1263
  - Colorado aqueduct system, 29
  - Des Moines, Iowa, 96
  - design, health hazards in, 1148
  - efficiency, increasing, 1110
  - funds, danger of diversion, 1265
  - improvements by W.P.A. in N. Y. city, 823
  - labor relations in, 1279
  - New York state compared with Chilean, 1953
  - on Ohio river, 454
  - operation, health hazards in, 1151
  - personnel; selection of, 1311
  - social security for, 1124
  - practice, committee report, 481
- property development planning, 1271
- Tacoma, Wash.; construction program, 1575
- store and shop building, 1586
- valuation; in Canada, 1361
- in U. S., 1379
- Washington, D. C., 75
- Water-borne disease, *see* Disease
- Watershed; recreational use of, 724
- sanitation of, 714
- yields in Pennsylvania, 133
- Weather; *see also* Hydrology
  - effect of, on water-borne disease, 231
- Wells, *see also* Ground water
  - automatic water level recorder for, 200
  - centrifugal pumps for, 1675
  - gas pressures in, 2118
  - pumps, other applications for, 1684
  - screens, construction and use of, 939
- Wheeler filter bottoms; Akron, Ohio, 220
- Wholesale cost of water, 1096
- W.P.A. projects in New York City, 823
- Yarn, *see* Calking



## AUTHOR INDEX

- ALDRICH, E. H., *see* NEWSOM R.
- ALFKE, C. J., planning water works property development, 1271
- APPLEBAUM, S. B., *discussion*—lime softening, 1750
- ARNOLD, G. E., handling complaints about quality, 526
- AULTMAN, W. W., reclamation and re-use of lime, 640
- BACHMANN, F., water pretreatment, 1691
- BANNISTER, L. W., *discussion*—organization of water resources planning, 473
- BARBOUR, F. A., *discussion*—earth dams, 1359
- BARROWS, H. H., organization of water resources planning, 462
- BEAN, E. L., *discussion*—coagulation of soft waters with iron salts, 1717
- BECKWITH, H. E., testing centrifugal pumps, 2098
- BENNISON, E. W., construction and use of well screens, 939
- BEHRMAN, A. S., *discussion*—lime softening, 1753
- BLACK, E. B., *discussion*—inspecting pipe lines, 1469
- BLUM, L. D., standard classification of accounts and standard list of retirement units, 1763
- BOERENDANS, W. L., pressure air chambers in centrifugal pumping, 1865
- BRAGG, G. H., FOSTER, H. B., JR., AND WENTWORTH, W. E., treatment by coagulation and sedimentation without filtration, 1020
- BRAINARD, F. S., rate of flow register, 129
- BRISBANE, E. C., water-hammer control by proper valve installation, 1904
- BROWN, W. M., automatic water level recorder for wells, 200
- BRUSH, W. W., *discussion*—social security for water works men, 1132
- BURGESS, P., legal aspects of damages from leaks, 955
- BUSWELL, A. M., *see* HEDGEFETH, L. L.
- CALVERT, C. K., investigation of main sterilization, 832
- CAMPBELL, G. A., *see* SCHMELKES, F. C.
- CAPEX, C. H., wholesale cost of water, 1096
- CARPENTER, J. D., watershed yields, 133
- CARPENTER, L. V., SETTER, L. R., AND COATES, J. J., sulfur compounds for treatment of water and industrial wastes, 1400
- CARPENTER, P., *see* LEVINE, M.
- CHASE, E. S., applicability of service line materials, 1323
- CHATTERS, C. H., the recovery program, 1085
- COATES, J. J., *see* CARPENTER, L. V.
- COBLENTZ, J. M., *see* LEVINE, M.
- COBLENTZ, M. H., *discussion*—quality throughout the system, 78
- COFFEY, J. H., vertical pump applications, 1684
- CONRAD, A. J., *see* FRISK, P. W.
- COOK, A. T., increasing efficiency of water systems, 1110
- COOK, P. D., service materials, 1332
- COX, C. R., short schools and operator qualifications, 680
- water-borne gastro-enteritis, 1489
- discussion—ibid.*, 1509
- discussion*—super-chlorination practice in North America, 1558
- water and sewage works in Chile, 1953
- COX, G. J., fluorine in relation to dental caries, 1926
- CREAGER, W. P., design and maintenance of earth dams, 1335
- CRIST, M. L., public relations, 1308
- CURRY, W. G., *see* LAUTERBACH, F. R.
- DARBY, C. W., AND MALLMANN, W. L., studies on media for coliform organisms, 689
- DAWSON, F. M., AND KALINSKE, A. A., calculating water-hammer pressures, 1835

AUTHORS

- DE COSTA, J. D., *discussion*—handling complaints about quality, 532
- DEVENDORF, E., recreational use of reservoirs, 724
- DUNCAN, W. A., *see* ROUTLEDGE, G. G.
- EDMISTON, M., *see* LAUTERBACH, F. R.
- EGBERT, D. C., the water department as an independent utility, 2109
- EISNER, B., water problems at the New York World's Fair, 190
- ELLIS, R. H., *discussion*—charges for private fire protection, 2057
- ELMENDORF, C. E., air-trapped mains, 951
- ENGER, M. L., *see* WIGGIN, T. H.
- ERWIN, T. M., maintaining public confidence, 1135
- ESTY, R. W., *discussion*—urban domestic water consumption, 2015
- FABER, H. A., super-chlorination practice in North America, 1539  
*Author's closure, ibid.*, 1560
- FABRIN, A. O., centrifugal pumps designed for underground waters, 1675
- FLENTJE, M. E., talking to a non-technical audience, 1315
- FLETCHER, A. H., administrative problems of preventing and correcting defective plumbing, 969
- FRISK, P. W., AND CONRAD, A. J., determining residual ammonia in the presence of chloramine, 1197
- FOSTER, H. B., JR., *see* BRAGG, G. H.
- FUGATE, G. L., *discussion*—private fire protection charges, 2068
- FURMAN, R. W., *discussion*—water pretreatment, 1700
- GALLOWAY, J. L., the small water department, 2114
- GETTRUST, J. S., *symposium*—Wheeler bottom filters, 220
- GILCREAS, F. W., AND HALLINAN, F. J., iodide technic for colorimetric determination of chlorine in water, 1723
- GOIT, L. E., water-hammer studies in long pipe lines, 1893
- GOLDSMITH, C., efficient use of water for fire fighting, 2027
- GORMAN, A. E., potential health hazards in distribution, 1143
- GORMAN, A. E., AND WOLMAN, A., water-borne outbreaks in the United States and Canada, 225
- GOTAAS, H. B., physical property records, 517
- GRAHAM, B. W., factors in coagulation, 67
- GREEN, H. T., regulations for water main installations, 2047
- GRIFFIN, A. E., reaction of heavy doses of chlorine in various waters, 2121
- GROSS, D. D., maintaining proper charges for private fire protection, 2053
- HALLINAN, F. J., *see* GILCREAS, F. W.
- HATCH, G. B., *see* RICE, O.
- HARRINGTON, G. E., quality throughout the system, 74
- HEDGEPEETH, L. L., AND BUSWELL, A. M., a definition of "available chlorine," 2135
- HELBIG, W. A., uniform basis for activated carbon comparison, 1931
- HINDS, J., Colorado aqueduct distribution system, 29
- HOFFMAN, M. F., consumers accounting and collecting, 1769
- HOOVER, C. P., *discussion*—reclamation and re-use of lime, 675
- HOLTJE, R. H., reservoir trouble-makers, 550
- HORNING, E. S., *see* SCHMELKES, F. C.
- HOWELL, E. M., trailer camp sanitation, 727
- HOWSON, L. R., adaptability of materials in main construction, 1002
- HUNTER, C. A., *see* WEISS, J. E.
- JOHNSON, W. A., pipe coating, electric drainage and grounding practice, 1290
- JORDAN, H. E., *discussion*—fluorine in dental caries, 1930  
*discussion*—charges for private fire protection, 2060
- KALINSKE, A. A., *see* DAWSON, F. M.
- KEITH, J. C., valuation of water works systems in Canada, 1361
- KELLY, E. M., *discussion*—reclamation and re-use of lime, 670
- KILLAM, E. T., *discussion*—inspecting pipe lines, 1468  
*discussion*—service lives of water mains, 1653
- KLASSEN, C. W., *see* SPAFFORD, H. A.
- KNOX, S. K., *discussion*—ground water replenishments, 180
- KOENIG, E. A., *see* LOGAN, K. H.
- KRAMER, W. A., *discussion*—lime softening, 1747

- KUNIGK, W. A., Tacoma's water works construction program, 1575
- LA DUE, W. R., *discussion*—water system efficiency, 1119
- LARSON, T. E., bacteria, corrosion and red water, 1186  
differential gas pressures in wells, 2118
- LAUTER, C. J., *symposium*—slat bottom filters, 213
- LAUTERBACH, F. R., CURRY, W. G., PINKHAM, C. M., EDMISTON, M., AND MYERS, H. C., unusual water treatment methods and equipment, 1033
- LAWRENCE, R. L., JR., cross-connection elimination in Nashville, 977
- LENDALL, H. N., hydraulics and water works engineering, 2073
- LEVINE, M., CARPENTER, P., AND COBLENTZ, J. M., bacteria from chlorinated waters, 1511  
*see also* VAUGHN, R.
- LIPPINCOTT, J. B., southwestern border problems, 1
- LIRA, L., water and sewage works in Chile, 1949
- LLOYD, J. M., super-chlorination for taste and odor control, 2130
- LOGAN, K. H., AND KOENIG, E. A., inspecting pipe lines, 1451
- LORDLEY, H. E., AND SMITH, M. C., use of sodium silicates, 2149
- MCBRIDE, G. A., lime-soda water softening, 558
- MCCRADY, M. H., *discussion*—typhoid fever in Minneapolis and gastro-enteritis in Milwaukee, 384  
bacteriological examination of water supplies, 1226
- MCGONEGAL, A. R., plumbing hazards, 987
- MAFFITT, D. L., social security for water works men, 1124
- MALLMANN, W. L., *see* DARBY, C. W.
- MASTERSON, W. D., private fire protection charges, 2061
- MEYERHERM, C. F., *discussion*—pipe coating, electric drainage and grounding practice, 1303
- MITCHELL, N. B., *see* VAUGHN, R.
- MOORE, E. W., graphic determination of carbon dioxide and the three forms of alkalinity, 51
- MOORE, W. D., new law of design of cast iron pipe, 1655
- MYERS, H. C., *see* LAUTERBACH, F. R.
- NEWSOM, R., comments on report on depreciation, 837
- NEWSOM, R., AND ALDRICH, E. H., service lives of water mains, 1625
- NORCOM, G. D., water quality, 1475
- OLSON, H. M., benefits and savings from softened municipal water, 607
- PENCE, J. P., Tacoma's new store and shop building, 1586
- PINKHAM, C. M., *see* LAUTERBACH, F. R.
- POND, M. A., urban domestic water consumption, 2003
- PORTER, F. S., complaints concerning water service, 536
- PURCELL, L. T., aging of reservoir waters, 1775
- QUILTY, P., W.P.A. projects in New York City, 823
- RAIT, D. D., flood control and water supplies, 434
- RICE, J. L., regulating water treatment in buildings, 81
- RICE, O., AND HATCH, G. B., sodium hexametaphosphate in threshold treatment of municipal supplies, 1171
- ROPER, R. M., ground water replenishment by surface water diffusion, 165
- ROUTLEDGE, G. G., AND DUNCAN, W. A., building up valve seats by bronze welding, 2157
- RUDOLFS, W., developments in water treatment, 542
- RUDOLFS, W., AND WONG, T. T., correlation between carbon dioxide and mineral content of water and its corrosivity, 1909
- SAWYER, R. W., performance of upward-flow basins at St. Petersburg, 1755
- SCHAUT, G. G., fish catastrophes during droughts, 771
- SCHLICK, W. J., *see* WIGGIN, T. H.
- SCHMELKES, F. C., HORNING, E. S., AND CAMPBELL, G. A., electrochemical properties of chlorinated water, 1524
- SCHOENINGER, C. J., maintenance of electrical equipment in water works, 2085
- SCHWADA, J. P., budget planning for municipally owned water works, 1263

- SETTER, L. R., *see* CARPENTER, L. V.
- SHENKER, S., *discussion*—correlation between carbon dioxide and mineral content of water and its corrosivity, 1924
- SIMMONS, P. D., water systems on the Ohio river, 454
- SIMPSON, R. W., *see* SYMONS, G. E.
- SMITH, E. E., *discussion*—distribution system design for adequate fire protection, 2045
- SMITH, M. C., *see* LORDLEY, H. E.
- SMITH, R. B., industrial uses of Ohio river water, 451
- SOCHA, M. K., promoting the use of water, 105
- SOMERS, V. A., manholing fire hydrants, 186
- SOPP, G. C., gadgets become standard equipment, 114
- SPAFFORD, H. A., AND KLASSEN, C. W., Illinois's experiences in lime softening with short-time upward-flow clarification, 1734
- STANLEY, C. M., automatic control of water works, 87
- STEAD, F. M., sanitation of recreational areas, 714
- STEWART, E. P., installation of 54-inch steel intake line, 759
- STOCKWELL, H. P., water coagulation, 1387
- STOKES, D. B., *discussion*—new law of design of cast iron pipe, 1670
- STREETER, H. W., raw and treated water quality, 1479
- SYMONS, G. E., AND SIMPSON, R. W., bacterial pollution of the Niagara river, part I, 1156
- TATNALL, G., distribution system design for adequate fire protection, 2037
- TAYLOR, D. R., a one-act play on public relations, 2018
- TENNY, M. K., Des Moines iron problem, 96
- TOLLES, F. C., *discussion*—distribution system design for adequate fire protection, 2043
- UDWIN, M., dust filters for flue gas for carbonating, 1201
- ULLRICH, A. H., *discussion*—coagulation of soft waters with iron salts, 1719
- VANCE, L. S., meter settings and controlled compounding of meter batteries, 1049
- VAUGHN, J. C., laboratory control and operation, Hammond, Ind., filtration plant, 2137
- VAUGHN, R., MITCHELL, N. B., AND LEVINE, M., the Voges-Proskauer and methyl red reactions in the coli-aerogenes group, 993
- WALLENE, F. O., establishing sewer rental charges, 1964
- WEIR, W. V., *discussion*—legal aspects of damages from leaks, 965
- WEISS, J. E., AND HUNTER, C. A., simplified bacteriological examination of water, 707
- WENTWORTH, J. P., valuation for rate making in U. S., 1379
- WENTWORTH, W. E., *see* BRAGG, G. H.
- WESTON, R. S., *discussion*—water-borne gastro-enteritis, 1507
- discussion*—aging of reservoir waters, 1802
- WIGGIN, T. H., ENGER, M. L., AND SCHLICK, W. J., a proposed new method for determining barrel thicknesses of cast iron pipe, 841
- WILLCOMB, G. E., coagulation of soft waters with iron salts, 1703
- discussion*—iodide technic or colorimetric determination of chlorine in water, 1732
- WOLMAN, A., *see* GORMAN, A. E.
- discussion*—typhoid fever in Minneapolis and gastro-enteritis in Milwaukee, 385
- WOLMAN, L., labor relations in the water works field, 1279
- WONG, T. T., *see* RUDOLFS, W.
- YOUNG, C. H., Beaver river supply and low-flow augmentation, 419

## ABSTRACTED ARTICLES

### SUBJECTS

- Accounting; problems of utilities, 397  
requirements, inconsistent, by regulatory bodies, 397
- Activated carbon; adsorption, mechanics of, 1425  
chlorine sorption isotherms, 1426  
Cleveland use and specifications for, 1426  
evaluation of, 1426  
reservoir treatment with, 1423  
storage of, 1427
- Aerogenes influenced by bile, 913
- Air compression by water supply, 1815
- Air-conditioning; demands for water for, 1435  
reduction of water consumption for, 1436  
water supply for, in Illinois, 1436
- Air entrainment in moving water, 592
- Air raid precautions in London, 2174
- Akron, Ohio, operating practices, 1605
- Algae; as indicators of water condition, 918  
availability of nitrogen to, 920  
control of, 920, 1252  
filter clogging by, 1620  
in North Craig Reservoir, (Eng.), 1253  
screens for, 1253  
studies of; by Freshwater Biol. Assn., 918  
in Lake Sarah, 1255  
occurrence, 1255
- Alkali titration in water, 162
- Allergies, effect of water on, 1076
- Alum; chemistry of, 1616  
irritation of bathers' eyes by, 745  
new process for manufacture of, 750
- Aluminum; darkening of, by hot water, 1077  
detection of, with alizarin, 1832
- Amebiasis as a health problem, 1261
- Ammonia, determination in water, 1829
- Analysis, water; and sampling, 1421  
by N. J. health dept., 1422  
comparison of chemical and bacteriological, 1421
- Analytical separation of cations by extraction, 1827
- Animal life in fresh water, an identification manual of, 921
- Aquatic insects, manual of, 1259
- Argentine water; consumption of, 924  
systems for, 2171
- Arrears in water rates, 578
- Arsenic; determination of, 1830  
in Reichenstein, Ger., water supply, 1570
- Artificial pulsations in flow of rivers, 1249
- Asbestos-cement pipe, coated in N. H., 2185
- Australian well and drilling bit, 395
- Bacilli, slow lactose fermenting, 909, 910, 912
- Backwater computation, nomograph for, 1445
- Bacteria; counting method for, 1991  
detection of, by filtering, 1986  
diatoms in sea water, relation to, 916  
effect of storage on, 913  
enumeration of, by dilutions, 416  
growths of, in distribution systems, 1986  
in turtle eggs, 418  
in water, studies by Freshwater Biol. Assn., of, 918  
population of, successive dilution method of estimating, 1984  
quality of water, improvement of, 1419  
resistance of, to heat, 1988  
studies of nutrition for, 914  
studies of *Siderocapsa treubii*, 915
- Bacteriological; analysis, Danish standard for, 1978  
analysis with membrane filters, 1986  
total count, significance of, 912
- Bacteriophage; specificity for *Esch.-Aer.*, 913  
studies of, 914
- Bavarian water supplies, 392
- Belgium, water systems in, 2175

ABSTRACTS

- Bentonite; alum and, compared as coagulants, 1615  
as coagulant, 1616  
to prevent caking of iron sulfate, 1616  
reduction of alum by, 748  
reservoir leakage stopped by, 1604
- Bile media, 913
- Billing monthly increases collections, 577
- Biology of the Maschsee, (Ger.), 1258
- Bitumen coated steel pipe in houses, 606
- Boiler; blowdown control, 1624  
design advances, 1622  
feed control by diagrams, 1624  
feed deaerators, 1623  
feed water; purification, 1622  
treatment, 1979  
salines, recirculation of, 1623  
water; conditioning, 1622  
density determination, 1624  
treatment, value of, 1623
- Boston, history of water supply of, 2170
- Brantford, Ont., annual report, '38, 923
- Brass; effect of aluminum and-antimony on, 1995  
grades of, suitable for waterpipe, 1071
- British; report on stream pollution control, 595  
water supplies, 1432
- Buenos Aires; buildings, plumbing in, 2172  
water supply in, 923
- Calcutta, water supply, 145
- Canadian water works; directory of officials, 1432  
directory of systems, 1431
- Canton, Ohio, ground water supply, 2169
- Cast iron; steel pipe and, relative corrosion of, 408  
mechanite, high duty, 407  
pipe manufacture in Germany, 406  
testing and elastic properties of, 1597
- Catadyn sterilization of water, 746
- Cathodic protection, 601  
of elevated tanks, 1604  
of pipes, 602, 1826
- Cement; effect of fineness of, on concrete, 159  
portland; low heat, 1238  
specifications for, 1236  
special, in U. S. and Sweden, 1237
- Charleston, W. Va., water company practices, 2169
- Charlotte, N. C., water works improvements, 2169
- Chemicals, use of, in Canadian water works, 1613
- Chemistry, sanitary, as a vocation, 140
- Chesley, Ont., new well supply in, 1059
- Chicago lake diversion, history of, 2168
- Chloramine resistance of *E. Typhosa*, 1987
- Chloride determination affected by other ions, 1831
- Chlorinated copperas solution, 750
- Chlorinating plant designed for safety, 743
- Chlorination; de-chlorination and, for army troops water supply, 744  
of well water, London metr. water bd. policy, 742  
summary of practice, 742  
terms and definitions, 744
- Chlorine; allergy to, 745  
effect on tests for *Esch. coli*, 1987  
paint resistant to, 745
- Chlorophyll content of lake water, 1257
- Cincinnati, Ohio; in '37 flood, 152  
maintenance methods, 1606
- City, legal rights of, 577
- City limits, operation of water dept. outside of, 577
- Clarifier unit, new, combined, 751
- Clarksburg, W. Va., rate and accounting ruling at, 400
- Cleaning mains with air bubbles, 1599
- Coagulation; by sodium aluminate, 749  
effect of pH and alkalinity, 748  
of the Loire (Fr.) waters, 748  
studies of, at Buenos Aires, 747
- Coal as softening agent, 758
- Coatings, bituminous, 605, 606  
metallic, in sea water, 606  
protective, formation of, in pipes, 596  
resin, 606
- Cold weather; effects of and protection of water works in, 403  
injuries, liability for, 404
- Coli and aerogenes differentiation, new method of, 1985
- Coliform; bacteria, nitrogen utilization of, 915  
growths in water, 417
- Coliform organisms; comparative methods for detection of, 414



- false positive reaction for, 415  
 longevity of, in stored water, 1991  
 slow lactose fermenting, 909, 910, 912
- Collection arrears, data on, in Canada, 578
- Color comparator with variable depth, 413
- Colorado R. aqueduct; need for, 1430  
 pumps in, 580
- Concrete; bonding of old surfaces, 1240  
 effect of sulfate waters on, 159  
 pumping of, in cold weather, 157  
 repair of, 158  
 resistance of, to corrosion, 160  
 structures, 1238, 1239  
 vibrations; harm to, by, 1240  
 placement by, 1240  
 in Sacramento tanks, 406
- Congressional attitude towards utilities, 931
- Connecticut reestablishes state civil service, 936
- Consumption of water in German cities, 1433
- Contractors, and damage suits, 580
- Cooling tower design, 2193
- Copper, adsorption of, by chlorinated copperas, 1613  
 alloys in water works, 154  
 physiological effects of, 1810  
 removal of, from water, 1613
- Copper sulfate feeding equipment, 1612
- Corpus Christie; concrete reservoir at, 1603  
 supply main in, 1064
- Corrosion, biochemical investigation of, 1822  
 by salt solutions, 597  
 calculation of chemical dosage for control of, 596  
 due to cavitation and drop impact, 583  
 electrolytic and cathodic protection from, 602  
 inhibition of, by organic film, 605  
 measurement of, 1821  
 micro-biological experiments in anaerobic, 1822  
 of cast iron, 1818  
 of metals by soil and water, 598  
 of plumbing, 1997  
 of steel affected by deformation, 606  
 prevention; by benzyl cellulose, 605  
 in acid waters, 603  
 in hot water systems, 1824  
 principles, 597
- soil; correlated with electrolytic tests, 1821  
 of lead and iron, 600
- Couplings, development of, in France, 2185
- Cross connections; check valve maintenance, 1812  
 elimination of, in San Francisco, 1812  
 hazard of, measured by vacuum frequency, 1814  
 in Sandusky, Ohio, 1813
- Cultus Lake, B. C., study of, 1254
- Cyanide compounds in water, 1977
- Dam; at Paris, Ark., failure of, 1251  
 Bartlett, highest multiple arch at, 1241  
 galleries, stresses adjacent to, 1244
- Dams, steel facing for, 1246
- Danbury, Conn., filter plants, 1620
- Danish; report of "new" disease, 1261  
 standard bacteriological analysis of water, 1978
- Daytona Beach, Fla., softening plant, 755
- De-acidification and use of Magno at Frankfurt a/M., 1826
- Delaware R., pollution control by 4-state agreement, 594  
 supply for N. J., 921
- Denver, Colo., annual report, '37, 147  
 '38, 2167
- Depreciation; accounting, 396  
 views on, 396
- Des Moines filter gallery supply, 1059
- Diesel; injuries due to oil injection, 157  
 pumping at Milford, Mass., 157
- Disabilities among utility employees, 142
- Distilling optically empty water, 1993
- Distribution system maintenance, 1064
- Dog as source of paratyphoid infection, 737, 1260
- Drinking fountains, design of, 1262
- Dusting tendency of powders, 1614
- Dysentery; bacillary, 740  
 epidemic in Japan, 741  
 in Glasgow, 1260  
 shiga, in Illinois, 1810  
 water-borne, in N. Y. state, 739
- Eddy diffusion, 1441
- Eildon, Australia, rockfill dam subsidence, discussion of, 1242
- Ejectors, performance of, 1448
- Elbe R. pollution (Ger.), 918
- Electric motors, speed control of, 585

- Electrical; anti-freeze device for pipes, 1998  
 equipment maintenance, 155  
 Electrolysis; of carbonator, illness caused by, 602  
 prevention of, at Three Forks, Mont., 409  
 Emergency A. R. P. organization of water works in Sheffield, Eng., 2174  
 Employees; government, in U. S., 937  
 public, retirement systems in U. S. for, 934  
 retirement system, how to develop, 935  
 Engines, gas, maintenance guide, 2193  
 English and French water supplies in '38, 926  
 Erie, Pa.; '38 annual report, 1430  
 water works practices, 1064  
 Erosive power of streams (historical), 591  
*Esch. Coli*; and *Aer. Aerogenes*, medium for differentiation, 416  
 determination by incubation at 44°C., 416  
 effect of chlorine on tests for, 1987  
 most probable number, method of expressing, 415  
 reduction of, by nitrites, 915  
*Escherichia*, chromogenic strains of, 914  
 Evaporation of water; into quiet air, 152  
 into turbulent air, 151  
 Exhibits as educational media, 933  
 Expansion joints in concrete structures, 1239  
 Field laboratory kits, 1993  
 Filter; bed agitation with "sweeps", 1621  
 cleaning with sulfur dioxide, 1621, 1622  
 clogging by flood detritus, 1621  
 plant, new, of St. Louis County, Mo., 1620  
 sand characteristics and tests, 1618  
 stoppage by algae, 1620  
 Filtration; historical development in N. J., 1619  
 vs. chlorination, 743  
 Financing; of utilities in '38, 1434  
 of water works by French govt., 2176  
 utilities under Holding Company Act, 575  
 Fire; hazard of, in power plants, 389  
 hose threads, standard, small, 389  
 loss from, in U. S., '38, 388  
 service; charges for private, 401  
 rates, determination of, 400  
 Fish life in reservoirs, 1253  
 Flood; hurricane and, of Sept 21, '38, 153  
 Los Angeles, Mar. '38, 152  
 maximum probable, and spillway capacity, 735  
 Florida waters, treatment of, 1605  
 Flow; analysis, direct solution by dimensionless ratios, 1437  
 effect of grid on, 1442  
 formulas, graphic representation of, 1441  
 in large pipe bends and siphons, 1438  
 in pipes, turbulent and transition, 1439  
 of air-fluid mixtures in pipes, 1447  
 of suspensions through pipes, 1448  
 pipe; new method of presenting, 1437  
 nomogram for, 1441  
 resistance in pipes, 1440  
 turbulent, in open channels, 1442  
 Fluoride; determination with thorium nitrate, 1832  
 in water pathology and removal, 1981  
 physiological effect modified by other minerals, 1081  
 Fluorides; as a possible factor in dental caries, 1980  
 determination of, 1833  
 fluorosis and dental caries in Ill., 1981  
 in Louisiana, ground waters, 1982  
 Fluorine; and goiter relationship, 1983  
 content of tooth enamel and its effect on caries, 1981  
 in New Mexico waters, 1983  
 in water and food, comparison of effects, 1083  
 in waters of the Netherlands, 1983  
 removal at Amarillo, Tex., 1613  
 removal studies, 1982  
 Fluorosis; allowable amounts of fluorides in water, 1083  
 and dental caries, 1081  
 characteristics of, 1981  
 dental, a review, 1082  
 halted by change in water supply at Bauxite, Ark., 1080  
 in Krawang, 1983  
 in Morocco and U. S. compared, 1082  
 in Oklahoma, 1081  
 in South Dakota, 1080  
 summary of literature on, 1982  
 surveys in Ohio, 1982

- Food poisoning caused by electrolysis of carbonator, 602
- Forest influence upon runoff, 733
- France, promotion of use of water in, 934
- Freezing of building materials, 157
- French; comments on American water works, 1430
- water consumption, 1432
- water works, rates, consumption and earnings, 576
- Freshwater Biological Assn. (Br.) Sixth Report, 918
- Frost bursting of pipes, avoidance of, 153
- Gage, water level, radio, 735
- Gas engines, maintenance guide, 2193
- Gastro-enteritis; milk-borne outbreaks, 739
- outbreak in Scotland, 740
- paradysentery and, 1261
- Geophysical prospecting for water, 395
- Germany; planning of water resources in, 392
- rainfall records in, 2001
- water supplies and the state water law in, 1433
- Goiter; caused by lack of water-borne colloid, 1079
- incidence related to iodine content of water, 1079
- incidence related to soil and water, 1079
- iodine and, in Jehol, 1079
- water-borne?, 741
- Golden Gate Fair water system, 145
- Gorge Dam, Hong Kong, 1243
- Goya, Arg., water supply improvements in, 1611
- Great Lakes, hydrology of, 1252
- Greenwood, S. C., water works, 1605
- Ground water; control of, in Texas, 1056
- flow formula, 394
- fresh, from above salt water in South Australia, 395
- in Illinois, 1059
- in Iowa, analyses of, 1059
- recharging methods, 1056
- studies in Germany of, 1816, 1817
- supplies, general discussion of, 1061
- supply of London, exhaustion of, 395
- temperature records, 1817
- variations in Wisconsin, 1057
- Grounding electric circuits on water mains, 408
- Grounding beneath dams, 1244
- Hardness and sulfate determination, 1832
- Hamilton, Ont., annual report of water dept., 2170
- Hartford, Conn., '37 report of water bur., 148
- Holding Company Act, financing under, 575
- Home building in U. S., by regions, '37-'38, 930
- Honolulu water works, 1607
- Hose threads, standard small, 389
- Hurricane damage to Bristol, R. I., water works, 922
- Hyacinth, destruction of water, 1252
- Hydrants; maintenance of, 2190
- standardization of; in Germany, 1600
- Hydrants; marking of, 1600
- rates for private, 402
- Hydraulic; calculations discussed, 1449
- flow formula, general, 588
- jump; in closed conduits, 593
- in trapezoid channels, 592
- laboratory; at St. Anthony Falls, Minn., 594
- at Zurich, Switz., 594
- models, friction in, 1447
- research; discussion of, 1449
- projects in progress, 593
- Hydrogen exchange materials, 758
- Hydrograph, unit, of small water sheds, 1998
- Hydrographic data for Italy, 2002
- Hydrologic cycle and evaporation, 151
- Hydrological studies in Germany, 2000
- Hydrology of Jaffra, Ceylon, 2002
- Illinois ground waters, 1059
- Incubation at 44°C., 1988
- Indian water works problems, 1608
- Indiana state; bur. san. eng. report, '37-'38, 1606
- health dept. report '36, '37, 144
- Indianapolis; elevated tank at, 2190
- water company operation, 2168
- Indicators, spectrophotometric study of, 414
- Industry, uses of water by, 1978
- water needs of, in New England, 1979
- Inhibitors, effect of, in protecting metal from acid, 1826
- Iodine; determination of, 1829
- goiter and, in Jehol, 1079
- Iowa ground waters, 1058
- analysis of, 1059
- Iron removal at Goya, Arg., 1611

- Kansas City, Mo., report of treatment plant, 149  
 Kiel, Ger., water supply, 928
- Laboratories, value of, 579  
 Laboratory sterilization in France, 410  
 Landscaping reservoirs in Germany, 730  
 Langelier method, discussion of, 1823  
 Late lactose fermenting organism, 909, 910, 912  
 Latrobe, Pa., water company, commission order refinancing, 399  
 Lead arsenate in the body, 1076  
 Lead; determination of, in water, 1829  
   in food, 1077, 1810  
   in tin coatings, harm from, 155  
   new color reagent for, 1828  
   physical properties of, 1072  
   physiological effect of, 1077  
   poisoning, chronic, from water and fruit, 1078  
   solubility of, in water, 1078  
   solution, chemistry of, 1997  
 Leak and waste elimination at Cicero, Ill., 1601  
 Leakage; reduction of, 1601  
   tests of new mains, 408  
 Leaks in plumbing, location of, 1996  
 Light, submarine, estimated by effect on diatoms, 1258  
 Lima, Ohio, operating data, 149  
 Lime; feeder dust elimination, 751  
   storage hazard, 390  
 Limnology of the Schleinsee, 1258  
 Lining mains in place, 2187  
 Little Rock, Ark.; annual report '37, '38, 2167  
   water works uses radio, 2168  
 Locarno, Switz., water works, 2177  
 London, Eng.; new water laboratories, 410  
   met. water bd., extracts from '37 report, 925, 1417  
 Los Angeles, annual report, '38, 2166  
 Louisville, Ky.; water practices, 1606  
   water works flood protection, 922
- Madras, India, report for '37, 1608  
 Magnesia determination by palmitate method, 162  
 Magho for de-acidification of waters, 1825  
 Main; break detectors, 1065  
   cleaning experiences at Skowegan, Me., 1599  
   costs, factors affecting, 2185  
   laying costs, 1598  
   reconditioning in New Zealand, 2189  
   replacement in winter, 405  
   Tod River (Australia) reconditioning of, 2187  
 Malay water works, 1608  
 Manchester, N. H., operating experiences, 405  
 Manganese; determination, 1830  
   poisoning, 1075  
 Maryland dept. of health annual report, '38, 1430  
 Materials, new, in Germany, 155  
 Mead Lake, passage of turbid water through, 732  
 Media containing milk, relative productivity of, 1984  
 Merit system; and public service personnel rating, 139  
   provision for existing personnel under, 140  
 Meter; box, concrete, 1996  
   choice for important service, 1996  
   location practice in Canada, 1996  
   maintenance at Pittsburgh, 1995  
   option allowed to customers, 2184  
   practices at Indianapolis, 1994  
   rate recorder, use of, 1996  
   readers, inspection by, 1602  
   shop for Los Angeles dept. at Van Nuys, 1994  
   test analysis, chart for, 155  
   testing at Waukesha, Wis., 1994  
 Metering in Johannesburg, South Africa, 1602  
 Mexico City water supply history, 394  
 Microphotography, home-made apparatus for, 1992  
 Microscope, polarizing, in crystal analyses, 1992  
 Milky water explained, 933  
 Mineral content of Wisconsin lakes, 1255, 1256  
 Minimum water bills, percentage, in Canadian cities, 402  
 Minnesota water works projects by WPA, 930  
 Mixer design, 751  
 Movies for showing municipal activities, 933  
 Municipal report, annual, specifications for, 150
- Netherlands; gov't. water supply bureau, '37 report, 928  
   ground water nomenclature, 394  
   rainfall, evaporation and ground water in, 151  
   water towers, 405

- Water Works Assn. convention report, 927
- New Bedford, Mass., '37 report of water bd., 147
- New Hampshire water supplies, 143
- New York State health dept. report '36, 144
- Nicotinic acid and dextrose fermentation by bacteria, 915
- Nitrogen balance of lakes, 919
- North African water supplies, 2180
- North Carolina regulation of reservoirs, 732
- North Dakota ground waters, 143
- Odor difficulty at Defiance, Ohio, 1423
- Odors, rating the ability to detect, by individuals, 414
- Oil vs. coal for power, 2194
- Oklahoma City, remote control of tanks and pumps, 1602
- Oligodynamic or "activated" ice, 747
- Open channel control section, design of, 1444
- Operator regulation in Ohio, 140
- Organolites, 756
- O'Shaughnessy dam, raising, 1241
- Ottumwa, Iowa, water works operation, 922
- Oxygen; deficit of, in lake waters, 1257  
dissolved, field determination of, 1830, 1831
- Ozone for water treatment, 745
- Paint; biological factors affecting, 605  
durability, 603
- Painting; pretreatment of metal surfaces for, 603  
steel tanks, chemical preparation of surfaces for, 1604
- Paraná, Arg., enlargement of water supply for, 2172
- Paratyphoid-enteritis bacteria in water, 1810
- Paris, and suburbs, water supplies of, 2176
- Parshall measuring flumes, dual, 589
- Particles, size of, moved by a stream, 590
- Pasadena, Calif., laboratory control, 1422
- Pavement cuts, control of, 578
- Petri dish, multiple compartment, 412
- Phenol; conductometric titration, 163  
detection and estimation, 162  
determination by pierate method, 1833  
physiological effect of, 1076  
sensitivity of tests for, 163  
taste elimination in Germany, 1423  
taste, mysterious, 1424
- Phosphatic soil, effect on fluorosis, 1083
- Photoelectric methods, bibliography of, 1834
- Photographic record of plate cultures, 1992
- Photography of microscopic organisms, 1992
- Pickling liquor as coagulant, 1615
- Pipe; cast iron, manufacture in Germany, 406  
cleaning, two methods of, 1600  
couplings, French development of, 2185  
England's largest all welded, 1070  
jointing; compounds, sulfur, 1070  
material, Sinterite, 1071  
materials, tests of, 1071, 1598  
practice device for, 2185  
line contractions, hydraulics of, 592  
materials and joints used in France, 1065  
repair methods, emergency, 1065  
service, new materials for, 407  
specifications, cast iron, British, 407  
steel, jointing of, 1067  
thawing, electrical, 1998  
transite, water hammer in, 587  
warning signal of, for excavators, 1599
- Pittsburgh, history of water works of, 146
- Plankton; as pollution indicators, 916  
counting methods, 917  
effect on numbers of bacteria, 916  
growth in a Westphallian lake, 1257  
of Shannon R., 1255
- Plumbing hazards; avoidance of, 1814  
measured by vacuum frequency, 1814  
rating of, 1262
- Plumbing studies, 1814
- Pollution; of Illinois R., 595  
of streams, indicated by plankton, 916
- Population; of U. S., July 1, '38, 578  
post-censural estimates, 578
- Pressure regulators, experiences at Denver, Colo., 2189
- Promotion of use of water, 579
- Property owner's responsibility for water, 579
- Public health service leaves the treasury dept., 1807

- Public relations, 140  
 methods, 932  
 suggestions to improve, 933
- Puerto Rican water supplies, 2170
- Pumping; by water turbine in N. Y. City, 1063  
 costs, reduction at Wyandotte, Mich., of, 584  
 emergency, portable generating sets for, 1063  
 power, comparison of costs, 156  
 practice in America, 2192  
 station, automatic, at Baltimore, 2191  
 systems, remedying water hammer in, 586
- Pumps; automatic station at Baltimore, 2191  
 centrifugal; cavitation of, 581  
 design of, 1062  
 efficiency and cavitation tests of, 582  
 control of, by pressure switch, 585  
 corrosion due to cavitation of, 583  
 Fareso rotary, 1063  
 for chemical service, 1614  
 in place of elevated tanks, 1603  
 materials for, 582  
 new design for reciprocating, 2193  
 of unprecedented efficiency, 580  
 remote control of, at Oklahoma City, 1602  
 size of, for automatic stations, 2192  
 testing with air, 2192  
 thrust bearing for, 2192  
 vertical turbine, for fire service, 584
- Purification by calcined dolomite, 1612
- Rainfall; evaporation and ground water in the Netherlands, 151  
 records; deriving characteristics from, 1250  
 in England, 1250  
 in Germany, 2001  
 in Scotland, 2000
- Rand (South Africa) water board, 34th annual report, 2180
- Rates; based on family size, 577  
 collection of, as fixed by law, 2183  
 consumption, earnings and, in French water works, 576  
 determination of; base, 398  
 for Jefferson City, Mo., 2183  
 for Pardeeville, Wis., 576  
 for business purposes in Canada, 402  
 for summer sprinkling, 1433  
 low, in Owen Sound, Ont., 2184  
 minimum, in Canadian cities, 1434  
 outside city limits, 402  
 prudent investment basis for, 398  
 social considerations and, 2184  
 studies of, ordered by Utah commission, 2184  
 to grantors of rights of way, 399  
 to outside municipalities, 1433
- Recreational use of reservoirs, 730
- Reservoir; composition affected by sludge, 1259  
 concrete, for Corpus Christi, 1603  
 design to avoid mosquito nuisance, 731  
 Dunwan, Renfrew, Eng., 1242  
 lands used for recreation, 730  
 leakage stopped with bentonite, 1604  
 plankton replaced by oscillatoria, 1298  
 signal, home-made, 2191  
 turbidity bypassed at low level, 733  
 weed control by Benoclor, 1252
- Resin coatings, 606
- Resins, synthetic, alkali adsorption, 757
- Retirement system, how to develop, 935
- Rhone R. to be canalized, 2177
- Ridgewood, N. J., water dept., 2169
- Rio Gallegos, Arg., water works, 2172
- River control; principles, 1248  
 storage works and, in '38, 927
- River crossing for water pipes, 1600
- Rivers Loire and Allier (Fr.), confluence of, 1250
- Root growth in valve, 1074
- Rotameter calibration, 1448
- Rouen, Fr., water supply, 393
- Rubber in water works, use of, 1069
- Ruhr district (Ger.), water and sewage control in, 2177
- Rumanian ground waters, analyses of, 393
- Runoff, analysis of characteristics of, 1246  
 discussion of characteristics of, 1999  
 distribution graphs, 1999  
 from farm country, 736
- Safety for chemical workers, 142
- Salary scale, adjustable to living costs, at St. Paul, 139
- Salt content of water, allowable, 1422
- Salt-taste threshold in man, 1978
- Samples; continuous, for liquids, 412  
 for lake deposits, 1259
- Sampling and testing water, 1421
- San Francisco, Arg., water supply projects, 923



- Sand; moisture test, 160  
porosity in water bearing strata, 1816  
stability in dams, 1245
- Sanitation in Illinois, 739
- Savannah, Ga., well supplies, 1060
- Sedimentation; meter, new, 750  
studies at Buenos Aires of, 747  
theory and practice of, 1614  
used for photographic size analysis, 751
- Selenium; in the body, 1076  
toxicity influenced by diet, 1977
- Service connections, Canadian practice with, 1996
- Service pipe; graphical determination of size of, (Ger.), 1073  
materials; esp. copper, 154  
life of, 1073  
in use in Canada, 1073  
replacement method, 1073  
under highway, responsibility for, (Eng.), 1074
- Sewer rental; experiences, 402  
in Michigan, 403  
symposium, 2182
- Sewerage financing in France, 576
- Shanghai, water works annual report, '38, 2181
- Shasta Dam details, 1240
- Showers for attachment to hydrants, 933
- Silica-Calcium oxide reactions, 1238
- Silica; determination of, 1830  
determination of, in water, 164  
physiological and pathological aspects of, 1074  
solubility of, 163  
solution of, from glassware, 164
- Silicate treatment of water, 1617
- Singapore water works, review, 146
- Snowfall observations, 734
- Snow surveys, 150  
for stream flow forecasting, 1248
- Snyder, Okla., new supply, 1431
- Sodium aluminate, use of, as coagulant, 749
- Sodium silicate; effect of, with alum, 1617  
use of, as coagulation aid, 749  
use of, at; Lima, Ohio, 1617  
Toledo, Ohio, 1616  
Cordoba, Arg., 1617
- Softening; at Daytona Beach, Fla., 755  
at Newnham, Eng., 756  
at St. Augustine, Fla., 755  
costs, 753  
new practices at Springfield, Ill., 752
- plant design, discussion of, 752  
plant of C.B. & Q.R.R. at Galesburg, Ill., 755  
practices in France, 758  
precipitation speeded with marble, 754  
recarbonation after, 754
- Soil; aggressiveness of, determination of, 1821  
corrosion data of U. S. bur. stds., 1820  
corrosion of, related to soil properties, 601  
weights of, charts for, 1246
- South American water works, 924
- Spectrographic analysis of Buenos Aires water, 1834
- Speed control for electric motors, 585
- Spillway; design for, 735  
model tests, 1245  
rating by model, 588
- Spores; bacteria-bearing, sterilization of, 743  
observations on resistance to, 913
- Sprinkler charges in Canadian cities, 401
- Stability indicator, continuous, 1823
- Standardization of water works materials, Ger., 2179
- Starch as indicator in testing underground flow, 1817
- Steel pipe, use of; in New Westminster, B. C., 2186  
in Augusta, Me., 2186  
in Needham, Mass., 2186
- Sterilization; by steam, efficiency of, 411  
by various disinfectants, 744  
effect of air on, in autoclave, 1993  
of small supplies, 743
- Storm duration; typical, 735
- Streaking needle holder, 413
- Stream flow measurement; by flume, 589  
in U. S., 1250
- Stream pollution; British report on, 595  
in Sweden, 1140  
in West Virginia, 594  
indication by plankton of, 916
- Streptococci determination and removal, 1988
- Submarine pipe; at Hancock, Mich., 1601  
in San Francisco, 1601  
repairs of, at Bath, Me., 1601
- Submerged sluice gates, discharge of, 1445

- Sulfate determination, 161  
 Mutschin & Pollak method of, 161  
 potentiometric method of, 161  
 Sulfate, direct titration of, 1831  
 Swiss water quality standards, new, 1421
- Tank; elevated; at San Diego, Calif., 1603  
 of concrete, (Eng.), 1603  
 fire during painting of, 1605  
 remote control of, at Oklahoma City, 1602  
 spheroidal, at Brookline, Mass., 2190  
 town hall and, combined at Lake, Wis., 2191
- Taste and odor detection, 1424
- Taxation; of municipal utilities, proposed, in Alabama and Tennessee, 929  
 of states, municipalities and their employees by federal govt., 137
- Taxes; exemption from, intergovernmental, 929  
 rates of, in 294 cities, 930
- Tellurium lead for pipe, 1997
- Thawing services and mains by electricity, 404
- Threshold treatment, 754
- Tidal datum planes, 591
- Titration theory, 1833
- Traces, determination of, 1833
- Treatment; at Königsberg, Ger., 1611  
 of surface waters, (Fr.), 928  
 of water, (Br.), 1609  
 plant, all steel, at Irwin steel works, 1620
- Tungsten wire for streaking, 413
- Turbidity; classifier of, 412  
 measurement of, 1992  
 in Buenos Aires, 411
- Turbine; and pump runner materials, 582  
 steam, descaling with acid, 584
- Turbulence and diffusion, 1441
- Typhoid; bacilli; isolation of, 418  
 yellow, 1985  
 carriers, 737  
 attempts to sterilize, 1260  
 experiences with, 1808  
 incidence of, in Mississippi, 737  
 problem of, 1808  
 from hydrant drain pollution, 1813  
 history of, in U. S., 1809  
 in California, 738, 1811  
 in Nassau, 738  
 in N. Y. State from Indiana water, 736  
 in Philadelphia, 1259  
 in Strassbourg, Fr., 738  
 incidence by age groups of, 736  
 water-borne epidemics of, 736
- Underflow in Lee Lake, N. C., 732
- Uruguay, analyses of water sources in, 2173
- U. S. population, July 1, '38, 578
- Utah water supply developments, 921
- Vacuum frequency as a measure of plumbing hazard, 1814
- Valuation; considerations of, of water works, 399  
 practice in England, 1435
- Valves; operation and maintenance of, 2189  
 rotary, for high heads in New Zealand, 1245
- Venezuela progress in water supply, 393
- Vibrios in natural waters of India, 1985
- Victoria, B. C., water works, 2167
- Vienna water supply, 2179
- Wanaque, N. J., system, '37 report, 148
- War protection of water works, 2175
- Washington state water resources, 144
- Water analysis; bacteriological, trial of new British methods; in Argentina, 1989  
 in India, 1990  
 by exchange filter, 1827  
 popular misconceptions concerning, 1420  
 quality and, in Victoria, Australia, 1420
- Water; bills for, paid at banks, 577  
 consumption in France of, 1432  
 diviners, French inquiry into, 1062  
 exposition, international, Liege, Ger., 1432  
 sewage and, control in Ruhr district, Ger., 2177
- Water hammer; calculations and measurements of, 586  
 determination of, 587  
 in pumping stations, remedying of, 586  
 in Transite pipe, 587
- Water quality; standards, conditions, and, in Argentina, 1975  
 standards of, new Swiss, 1421
- Water resources; demands of agriculture on, 2002  
 of Queensland, Australia, 1607  
 planning in Germany, 392  
 principles of control of, 391

- Water supplies; ancient, 394  
 centralized vs. individual, 2178  
 contamination of, in Illinois, 1811  
 emergency, in London, 1432  
 engineering of, progress report, 1427  
 for war evacuated populations, 2176  
 in England in '38, 926  
 in Puerto Rico, 2170  
 inventory of, in U. S., 2171  
 joint, in Italy, 1609  
 population served by, in England, 2173  
 private, allowable, 931  
 progress in '38, 923  
 proposed planning and regulation of, in England, 390  
 systems of, in India, 2182  
 units of, combining in N. Y. State, 145
- Water works; management and rate fixing in, in England, 2174  
 practice in Ontario, 1431  
 structures, architecture of, in Germany, 1609  
 terms for, Spanish vocabulary of, 2173
- Water-borne diseases, 1809  
 Welded joints in pipe, 1070  
 Welding; of boiler drums in Europe, 2194  
 danger of, in unventilated places, 1599
- Wells; artesian, at Memel, Ger., 1060  
 construction materials for, 1061  
 design of, 1057  
 development of, in India, 1060  
 flow of water into, 1815  
 drilling of, need for regulation of industry, 1057  
 drilling bit for, Australian, 395  
 private, reliability of, 931  
 supply from, in African desert, 396  
 supply from, new, at Chesley, Ont., 1059  
 use of explosives in, 1061  
 yield formulas for, new, 1815  
 yield from, sand porosity tests, 1816
- Workmen's compensation in Ontario, 934
- World's Fair, N. Y., water system, 145
- Zinc determination; colorimetric, 1828

## INDEX OF ABSTRACT TOPIC HEADINGS

- Accounting, valuation and finance, 396
- Administration and personnel, 137  
 of water works, 577  
 Public, 929
- African and Asiatic water works, 2180
- Air-conditioning, water for, 1435
- Analysis, and water quality, 1417  
 Chemical, of water, 1827
- Bacteriology, 414, 909, 1984
- Boiler feed water treatment, 1622
- Cement and concrete, 1236
- Chemical, analysis of water, 161, 1827  
 feeding and coagulation, 747
- Coagulation, and chemical feeding, 747  
 and sedimentation, 1614
- Concrete, 157  
 Cement and, 1236
- Corrosion, and corrosion control, 596  
 of pipes, 1818
- Cross-connections—plumbing hazards, 1812
- Dams, 1240
- Distribution, mains, 403, 1064, 2185  
 mains and reservoirs, 403  
 storage, 1602  
 storage tanks, 2190
- Equipment, and methods for laboratories, 410, 1991  
 for pumping, 155
- European water works, 2173
- Finance, accounting and valuation, 396
- Financing and rates, 575, 1433
- Fire protection, 388
- Flood flows and runoff, 733
- Fluorides in water, 1080, 1980
- Ground water and wells, 394, 1056, 1815
- Health and hygiene, 1259, 1807
- Hydrants, and mains, 1597  
 and valves, 2189
- Hydraulics, 586, 1437
- Hydrology, 150, 1246, 1998

- Impounding reservoirs, 730
- Industrial water supply, 1978
- Laboratory equipment and methods, 410, 1991
- Leakage and waste, 1601
- Limnology, 1252
- Mains, 403
  - and hydrants, 1597
  - and reservoirs, 403
  - Distribution, 403, 1064, 2185
  - Reconditioning, 2187
- Meters and services, 153, 1994
- Microbiology, 916
- Mineral salts in water, 1074
- North American water works, 2166
- Odor and taste control, 1423
- Personnel, 137
  - Water works, 934
- Pipes, service, 1071
  - lines, submarine, 1600
  - Corrosion of, 1818
- Plumbing hazards, 1812
- Public, administration, 929
  - relations, 931
- Pumps and pumping, 580, 1062, 2191
  - and pumps, 1062
  - equipment, 155
- Quality, water, and analysis, 1417
  - Water, standards, 1975
- Rates, and financing, 575, 1433
  - and rate determination, 399
  - Water, 2182
- Reconditioning water mains, 2187
- Reservoirs, 403
  - Impounding, 730
- Runoff and flood flows, 733
- Salts, mineral, in water, 1074
- Sedimentation and coagulation, 1614
- Service pipes, 1071
- Services and meters, 153, 1994
- Sodium silicate, use of, 1616
- Softening, 752
- South American water works, 2171
- Standards of water quality, 1975
- Sterilization, 742
- Storage, distribution, 1602
  - tanks, distribution, 2190
- Stream pollution, 594
- Submarine pipe lines, 1600
- Supply, water—general, 143, 390, 921, 1427
  - industrial, 1978
- Tanks, distribution storage, 2190
- Taste and odor control, 1423
- Treatment, boiler feed water, 1622
  - Water, —general, 1609
- Use of sodium silicate, 1616
- Valuation, accounting and finance, 396
- Valves and hydrants, 2189
- Waste and leakage, 1601
- Water-borne disease, 736
- Water, Chemical analysis of, 1827
  - Fluorides in, 1080, 1980
  - for air-conditioning, 1435
  - Ground, and wells, 394, 1056, 1815
  - Mineral salts in, 1074
  - quality and analysis, 1417
  - quality standards, 1975
  - rates, 2182
  - supply—general, 143, 390, 921, 1427
  - industrial, 1978
  - treatment—general, 1609
- Water works, administration, 577
  - African and Asiatic, 2180
  - European, 2173
  - general, 1605
  - North American, 2166
  - personnel, 934
  - South American, 2171
- Wells and ground water, 394, 1056, 1815

## ABSTRACTED ARTICLES

### AUTHORS

- ABBOTT, G. A., 143  
 ABRAHAMCZIK, E., 1827  
 ADAMS, F. P., 923  
 AHUJA, M. L., 1985  
 ÅKERLINDH, G., 1250  
 AKEROYD, E. I., 757  
 ALBERTELL, H., 1611  
 ALDRICH, A. D., 1253  
 ALLEN, K. R., 919  
 ALLIATA, G., 2177  
 ALMQUIST, F. O. A., 1812  
 ALTON, R. A., 2182  
 ANABLE, A., 1614  
 ANDREASEN, A. H. M., 1614  
 ANGERER, R., 913  
 ARBATSKY, I., 1624  
 ARBATSKY, I. W., 1833  
 ARMSTRONG, W. D., 1981  
 ARNOLD, F. A., JR., 1980  
 ARTAZA, E., 924  
 ASGHAR, A. G., 161  
 ASHLEY, H. J., 1833  
 ATKINSON, H., 162  
 ATKINSON, N., 414, 415, 1420  
 AUBEL, E., 915  
  
 BABKIN, M. P., 1833  
 BACH, J. M., 747  
 BACIGALUPPI, J., 923  
 BADO, A. A., 1975  
 BAESE, E., 1996  
 BAHLMAN, C., 1616  
 BAILEY, S. M., 735  
 BAKER, J. G., 751  
 BAKER, M. N., 1619, 2170  
 BALDWIN, F. O., 750  
 BARDWELL, R. C., 141  
 BARENFANGER, C., 605  
 BARKER, R. S., 1057  
 BARNES, A. A., 1610  
 BARTELS, 155  
 BARTELS, H., 2184  
 BARTLETT, C. T., 1603  
 BARTRAM, M. T., 1984  
 BAUER, J., 398  
 BAXTER, G., 1609, 1610  
 BAYLIS, J. R., 748, 1419, 1617  
 BEITLICH, A. E., 1238  
  
 BELT, T. H., 1074  
 BENGOLEA, D. J., 747  
 BENGOUGH, G. D., 597  
 BERNARD, M., 734, 1247  
 BERRIAT, M. E., 2185  
 BESOMBES, 1250  
 BETTY, B. B., 1072  
 BEVIER, B. V., 1813  
 BIGGER, J. W., 417  
 BINNIE, W. J. E., 1243, 1432, 2173  
 BIRGE, E. A., 1255  
 BISCHOF, G. J., 2193  
 BLACK, A. L., 602  
 BLACK, A. P., 755, 755  
 BLACK, L. A., 1984  
 BLANEY, H. F., 590  
 BLAVOUX, A., 155  
 BLENCH, T., 588  
 BLOCH, E., 1260  
 BLUE, J. A., 1081  
 BOELTER, L. M. K., 152  
 BOERENDANS, W. L., 586  
 BOLENDER, C. S., 2168  
 BONILLA, C. F., 1437  
 BONNAR, R. U., 1832  
 BOSISIO, A. J., 2172  
 BOUCHER, R., 588  
 BOWLUS, F. D., 590  
 BRADFIELD, J. J. C., 1607  
 BRAGA, A., 418  
 BRAIDECH, M. M., 1425, 1426  
 BRATER, E. F., 1998  
 BRATTON, A. C., 1829  
 BRAYMAN, H., 931  
 BREKHUS, P. J., 1981  
 BRIGGS, G. M., 142  
 BROCKMAN, C. J., 1613  
 BRODBECK, C., 405  
 BROUGHTON, G., 757  
 BROWN, C., 148  
 BROZ, F. J., 1601  
 BRÜCHE, R., 1826  
 BRUNN, W. V., 394  
 BRUNS, H., 1809  
 BRUSH, W. W., 2185  
 BRYSON, L. T., 1818  
 BUCHAN, S., 395  
 BUNKER, H. J., 1822  
 BUONOMINI, G., 418

BURG, W. V., 1831  
 BURGESS, P., 752  
 BURN, G. A. H., 1431  
 BURNS, R. V., 1245  
 BURRELL, H., 756  
 BUTLER, M. R., 916  
  
 CABANNES, R., 155  
 CALANDRA, R. A., 923  
 CALVER, H. N., 933  
 CAMBESSEDES, H., 736  
 CANARIIS, S. A., 155  
 CAPEN, C. H., 745  
 CARDER, DEAN S., 406  
 CAREY, W. F., 751  
 CARNEY, L. E. J., 147  
 CARPENTER, P. L., 915  
 CARR, J. A., 2169  
 CARRIEU, M., 155  
 CARTER, H. E., 2000  
 CASAGRANDE, L., 1245  
 CASPERSEN, J., 737  
 CASSE, C. W., 1608  
 CHARNOT, A., 1081, 1083  
 CHARRIN, V., 758  
 CHELDELIN, V. H., 161  
 CHIODI, O. R., 1832  
 CHRISTENSEN, B. E., 161  
 CHUÍKO, V. T., 1830  
 CHYZEWSKI, E., 606  
 CLARK, E. V., 1242  
 CLARK, J. D., 1983  
 CLEGG, J., 1259  
 CLEVELAND, C., 1604  
 CLODIUS, S., 1071, 1598, 1600  
 CLYDE, G. D., 1248  
 COIN, 1992  
 COLEBROOK, C. F., 1439  
 COLLINS, W. D., 1978  
 COLLINS, W. T., 1999  
 COLLORIO, 1067  
 COLWELL, C. A., 914  
 COOK, A. T., 401, 924  
 COWAN, W. E., 1246  
 CRITES, G. S., 1061  
 CRONKRIGHT, A. B., 1262, 1814  
 CRUICKSHANK, J. M., 738  
 CSABAY, J., 1830  
 CUNNINGHAM, M. B., 1603  
 CURTISS, W. L., 1623  
 CZENSNY, R., 1254  
  
 DAHLE, D., 1832  
 DALE, F. A., 157  
 DANIEL'-BEK, V. S., 600  
 DANTIER, M. A., 576  
 DARE, H. H., 1242  
 DARNALL, M. B., 929  
 DARNIELLE, R. B., 1821  
 DARSEY, V. M., 603  
 DAUGHERTY, E. S., 1623

DAVIDSON, H. C., 396  
 DAVIES, A. J., 592  
 DAVIS, D. E., 753  
 DEAN, H. T., 1080, 1080, 1081, 1082, 1980, 1981  
 DEATHERAGE, C. F., 1981  
 DEBERARD, W. W., 922, 1994, 2168  
 DEBUSK, C. K., 731  
 DEMSKI, A., 1821  
 DENISON, I. A., 1821  
 DESCROIX, L., 577  
 DESCROIX, P., 576, 1430, 1432, 2176, 2176  
 LEVINE, J., 933  
 DIAL, D. E., 157  
 DIEFFENBACH, F., 603  
 DINNIS, F. R., 1057  
 DITZ, H., 159  
 DIVINE, W. R., 937  
 DOBBIN, R. L., 403  
 DOLCETTI, V. O., 1990  
 DOLLINS, C. W., 1072  
 DOMENCO, B., 1065  
 DOREY, S. F., 2194  
 DORFMAN, A., 914  
 DRAGONETTI, M., 1075  
 DRIDAN, J. R., 395  
 DRISCOLL, R. E., Jr., 748  
 DROBEK, W., 407  
 DRYDEN, H. L., 1441  
 DUCAU, E. E., 411  
 DUDEVANT, O., 748  
 DULANEY, A. D., 912  
 DUNBAR, W., 1253  
  
 EAMES, D. D., 156  
 EAST, L. R., 1243  
 EBNER, W., 1064  
 ECKART, N. A., 1601, 1812  
 ELVOVE, E., 1080, 1080, 1980  
 ENGEL, F. V. A. E., 592  
 ENRIGHT, D., 415  
 ENSLOW, L. H., 742, 1823  
 ENTRIKIN, J. B., 584  
 EPHRAIM, C. H., 737  
 ESTY, R. W., 1996  
 EVANS, B. S., 1828  
 EVANS, E. B., 415, 1427, 1616  
 EVANS, U. R., 597  
 EVERDINGEN, E. VAN, 151  
  
 FAIRHALL, L. T., 1076  
 FAREVAAG, P., 151  
 FARRELL, J. A., 151  
 FARROW, R. C., 150  
 FERRAMOLA, R., 416, 417, 1988, 1989, 1990, 2173  
 FIELD, A. M., 1073  
 FINKLE, R. D., 914  
 FISCHER, J., 1077  
 FLEISCHMANN, E., 606



- FLINT, E. A., 1255  
FOLEY, F. C., 395  
FOLPMERS, T., 1988  
FOLSOM, R. G., 1440  
FORTUNE, W. B., 414  
FOSTER, M. D., 140  
FOURCADE, J., 155  
FOURTANÉ, J., 1815  
FRANKLIN, P. R., 148  
FRASIER, E. S., 142  
FRENCH, P. H., 936  
FRICKMANN, W., 2002  
FRIEDRICH, D. W., 2000  
FROCRAIN, L., 748  
FRUITMAN, H. L., 412, 413, 413  
FULLER, E. S., 589  
FULLER, J. E., 913  
FULTON, A. A., 1610  
FURMAN, R. W., 1616  
  
GABBANO, L., 1615  
GAD, G., 1828  
GAFAFER, W. M., 142  
GANAPATI, S. V., 1608  
GARCIA, E. D., 750  
GARDINER, A. C., 1255  
GARDNER, H. B., 1995  
GASKIN, F. W., 1610  
GAUD, 1083  
GAYLORD, J. M., 580  
GEERLING, F. C., JR., 2175  
GELLER, W., 1077  
GELSTEIN, A., 1990  
GERBER, W. D., 1436  
GERMAIN, V., 934  
GERMANN, J. E., 404  
GESSNER, H., 160  
GETTRUST, J. A., 1615  
GIBSON, F. A., 1610  
GIETZ, C. E., 747, 1617, 2173  
GILARDON, A. A., 1989  
GIORDANI, C., 1065  
GIRARD, 410  
GLANGEAUD, L., 412  
GLASSPOOLE, J., 1250  
GLENDINNING, P. B., 1610  
GODDARD, P. H., 585  
GOFF, M. H., 157  
GOLDIE, A. H. R., 2000  
GOLDMAN, O. G., 605  
GOLDSMITH, A. O., 2168  
GOOD, T. W., 1602  
GOODWIN, C. A., 148  
GORDON, R. D., 416, 1984  
GOTTIFREDI, C. L., 2172  
GÖTTING, H., 2179  
GOURLEY, H. J. F., 1243  
GOVOROVA, R. P., 745  
GRABB, G., 1059  
GRAY, A. L., 737  
GRAY, E. R., 937  
  
GREEN, S. S., 160  
GREENFIELD, T. C., 1610  
GRIFFITH, J. R., 736  
GRIFFITH, P., 1061  
GRIME, E. M., 1061  
GRISWOLD, H. W., 1996  
GROSOWITCH, N., 915  
GROSS, D. D., 147, 1603, 2167, 2189  
GROSSMANN, A., 2192  
GROVER, N. C., 732  
GUILLERD, A., 2176  
GUNNESS, R. C., 751  
  
HAASE, L. W., 749, 1824  
HAEDRICH, V. W., 1448  
HAERING, D. W., 605  
HALL, E. B., 586  
HALL, G. L., 1430  
HAMILTON, B. L., 2189  
HAMPTON, B. C., 1807  
HANNE, R., 744  
HANSON, H. G., 579  
HARDMAN, Y., 915  
HARKNESS, B., 2187  
HAROLD, C. H. H., 1417  
HARRAL, J. C., 1829  
HARTUNG, H. O., 754  
HASBROUCK, H. C., 396  
HAUPT, H., 1078, 1997  
HAUPT, H. A., 1612  
HAUTUM, F., 1609  
HAYS, J. B., 1244  
HELLER, V. G., 1076  
HELLSTRÖM, B., 1237  
HENRICI, A. T., 915, 916  
HERNDON, L. K., 594  
HERR, J. O., 932  
HERRMANN, F., 1603  
HERSHEY, H. G., 1058  
HESS, O. B., 1604  
HETZER, M., 140  
HIBBS, A. S., 152  
HICKLIN, R. G., 755  
HICKMAN, H. C., 1252  
HIERONYMUS, F. M., 1431  
HILL, R. A., 732  
HILLHOUSE, A. M., 929  
HIRNER, F. J., 1998  
HOAR, T. P., 597  
HOESCH, K., 1808  
HOFFMANN, S., 746  
HOFMAN-BANG, N., 1614  
HOGUE, C. E., 1607  
HOLL, K., 1613  
HOLL, N. V., 1998  
HOLMQUIST, C. A., 144  
HOOVER, C. P., 753, 754, 1823  
HOPKINS, E. S., 141  
HORNE, H. A., 397  
HOSTETTLER, C. O., 1615  
HOUGH, J. L., 732

HOUK, I. E., 1244  
 HOUSER, D. L., 1982  
 HOWARD, C. D., 143, 1420  
 HOWARD, C. S., 732  
 HOWARD, R. R., 1599  
 HOWSON, L. R., 753  
 HOYT, J. C., 1250  
 HSING, P. S., 592  
 HUGHES, F., 1074  
 HUGHES, G. F., 147, 2167  
 HURLBUT, W. W., 2166  
 HUTCHINSON, E., 934  
 HUTCHINSON, G. E., 1257

IMBEAUX, E., 394  
 INGLESON, H., 1829  
 IRWIN, G. M., 2167  
 IVIE, W. B., 1240  
 IYER, P. V. S., 1990, 1991

JACKSON, L. A., 2167  
 JACOB, E. A., 921  
 JACOBS, E., 1618  
 JARVIS, C. S., 1999  
 JAY, P., 1980  
 JENIKOWSKY, F., 2179  
 JENKIN, B. M., 1259  
 JENKIN, P. M., 1258  
 JOHNSON, M. L., 1831  
 JONASSEN, F., 1440  
 JOOS, C. E., 1623  
 JUDAY, C., 1255, 1256  
 JULIUS, H. W., 1991

KABLER, P., 1987  
 KAGY, E. S., 1261  
 KAHLER, H. L., 1831  
 KALINSKE, A. A., 1437  
 KALPERS, H., 605  
 KARASSIK, I. J., 581  
 KARRICK, S. N., 2168  
 KATHE, J., 1076  
 KELSO, A. E., 1243  
 KEMPF, C. A., 1982  
 KENDALL, A. I., 914  
 KENNEDY, M. E., 735  
 KENNISON, K. R., 1444  
 KEPNER, R. H., 1447  
 KERR, S. L., 587  
 KESSLER, L. H., 587  
 KEULEGAN, G. H., 1442  
 KIMBERLEY, A. E., 753  
 KINDSVATER, C. E., 593  
 KING, E. J., 163, 1074  
 KIRCHNER, E., 1433  
 KLAS, H., 1821  
 KLASSEN, C. W., 595, 1981  
 KLEGERMAN, M. H., 753  
 KLEIN, H. V., 1258  
 KLIGLER, I. J., 915  
 KLINOV, I. Y., 606

KNIGHT, G. W., 1433  
 KNIGHT, R. G., 1242, 1243  
 KNOWLES, C. R., 1061  
 KNOX, W. H., 1982  
 KOEHNE, W., 1816  
 KOLKWITZ, R., 1258, 1621  
 KONSULOV, S., 1079  
 KOOLJMAN, J., 596  
 KOOLJMAN, L. H. L., 1983, 1986  
 KOOTZ, M., 1070  
 KOPECKÝ, F., 754  
 KOSER, S. A., 914  
 KOZMINSKI, Z., 1257  
 KRAHL, R., 928, 1061  
 KRAUS, L. S., 2193  
 KRAUSS, F., 931  
 KRIEGSMANN, K. F., 1257  
 KRYNITSKY, A. I., 1597  
 KUESTER, J. H., 1253  
 KÜNSTLER, D., 1076  
 KURANZ, A. P., 1994  
 KUUSINEN, J., 1441

LACEY, J. M., 1060  
 LACKEY, J. B., 916, 917  
 LAMBREV, Z., 1079  
 LANE, E. W., 592, 593  
 LAPSHIN, M. I., 163  
 LARSON, E. O., 921  
 LASAUSSE, E., 748  
 LATIMER, T. M., 2189  
 LECCHINI, S. I., 418  
 LeGRAND, J. P., 1061, 1062  
 LEIKHMAN, O. L., 600  
 LEINER, F., 2192  
 LE STRAT, A., 1817  
 LEVI, M. G., 1065  
 LEVINE, M., 913  
 LEWIS, A. D., 1243  
 LIANG, O. E., 1983  
 LIBBY, M. A., 1601  
 LIEPRINCK, F. A., 405  
 LIND, E. M., 1255  
 LINDAU, A. E., 1240  
 LINK, C. L., 933  
 LIOUVILLE, A., 1062  
 LLOYD, D., 151, 1243  
 LOEFFEL, W. F., 1448  
 LOGAN, K. H., 1820  
 LOGEMAN, R. T., 1246  
 LOHUIS, D., 1256  
 LOOYEN, A., 162  
 LUDWIG, C. A., 920  
 LYNDE, E. J., 1422

MABEE, W. C., 2190  
 MACCOLINI, R., 1260  
 MACDONALD, R. ST. J., 1814  
 MACDOWELL, R. F., 753  
 MACKENZIE, E. F. W., 744  
 MACLEAN, A., 1978

- MAFFITT, D. L., 1059  
 MAGNUSSON, K. E., 1260  
 MAHADEVA, S., 2002  
 MAHER, J. C., 1982  
 MAIER, E., 1992  
 MANGEREL, 1992  
 MANKE, 738  
 MANN, E. H., 1983  
 MARCANO, O., 2170  
 MARCOVITCH, S., 1083  
 MARKS, F. E., 1422  
 MARSHALL, J. B., 2169  
 MARSHALL, L. A., 1426  
 MARTIN, A. J., 1610  
 MARY, M., 159  
 MAYBEE, G. R., 1424  
 McCLENDON, J. F., 1829  
 McCLESKEY, C. S., 913  
 McClURE, F. J., 1980  
 McCrady, M., 910  
 McDonnell, J. N., 743  
 McFarland, D., 1240  
 McFAUL, W. L., 1433  
 McKay, F. S., 1080  
 McKeown, J., 153  
 McLaughlin, C. J., 137  
 McLean, W. N., 2000  
 McMillan, B. L., 1610  
 MEIER, R., 2178  
 MEISSNER, H. S., 1238  
 MELLON, M. G., 414, 1833  
 MELOCHE, V. W., 1255, 1256  
 MENSING, P., 1262  
 MERRIMAN, T., 1236  
 MESCHKAT, A., 918  
 MEYER, O. H., 1246  
 MICHAELSEN, G. S., 1987  
 MILBAUER, J., 750  
 MILLARD, M. K., 733  
 MILLER, A. P., 1814  
 MILLER, L. B., 1616  
 MILNE, 390  
 MINOT, A. S., 1077  
 MITCHELL, J., 1243  
 MITCHELL, N. W., 154  
 MITCHELSON, A. T., 1056  
 MOEHR, L. H., 584  
 MOHAUPT, R., 930  
 MOHLER, H., 1421  
 MOLSTAD, M. C., 151  
 MONICA, F. D., 1986  
 MONIER-WILLIAMS, G. W., 1810  
 MONTEVERDE, J. J., 416, 417, 1988  
 MONTI, G., 1065  
 MONTREY, C. E., 602  
 MOORE, E. W., 596  
 MOORE, H. F., 1072  
 MOORE, L. S., 139  
 MORAN, W. T., 1238  
 MORTIMER, C. H., 918, 919, 1259  
 MUELLER, H., 583  
 MÜHLENBACH, V., 1982  
 MÜLLER, F., 1060  
 MULLER, R., 161  
 MÜLLER, R. H., 1834  
 MÜNDEL, O., 1993  
 NAUMANN, K., 1828  
 NEAL, P. A., 1076  
 NETTLETON, T., 398  
 NEWSOM, R., 923  
 NICHOLS, M. S., 1981  
 NIMMO, W. H. R., 1243  
 NIRENSTEIN, R., 2171  
 NISBET, B. R., 740  
 NISNEVICH, E. M., 1986  
 NORDGREN, G., 1987  
 NÖTHLICH, F., 1817  
 NUEBLING, E., 155  
 NUNN, R. L., 1608  
 NUSS, M., 1817  
 OAKMAN, R. G., 2186  
 OBIDOWICZ, L., 408  
 O'BRIEN, M. P., 1440  
 OHLE, W., 1259  
 OKE, E., 585  
 OLDENBUSCH, C., 418  
 OVERFIELD, H. V., 1610  
 OWENS, J. S., 1833  
 PALMER, C. E., 1621  
 PALMER, F. F., 409  
 PALMER, H. K., 590, 1441  
 PAPP, S., 1832  
 PARKER, L. T., 399, 404, 577  
 PARTRIDGE, E. P., 1622, 1992  
 PATRICK, J. G., 412  
 PEETERS, H., 737  
 PEHRS, M., 1421  
 PELUFFO, A., 2173  
 PERAZZO, R. J., 1814  
 PERELLI, C., 416  
 PEREYRA, C., 747  
 PERRIER, E., 393  
 PERROT, L., 2175  
 PETTIS, C. R., 1252  
 PHELPS, E. K., 744  
 PIERCE, G. O., 1987  
 PIERSON, R. H., 1834  
 PILLAI, S. C., 1822  
 PLATKOVSKAYA, V. M., 168  
 PLETNIKOVA, E. I., 164  
 PLUCKER, W., 1825  
 PLUMB, D. S., 1448  
 POCCARD, A. G., 747  
 POE, C. F., 913  
 POHL, B., 579  
 POLOZOV, A. P., 745  
 POOLE, B. A., 144, 1606, 1622  
 POPP, M., 390

- POSEY, C. J., 592  
 POSTON, R. F., 1080  
 POWELL, S. T., 1979  
 POWERS, M. J., 913  
 PRATT, W. E., 1614  
 PRESCOTT, G. W., 920  
 PRICE, O. A., 1062  
 PRÜSS, M., 2177  
 PUGH, N. J., 2174  
 PURDY, A. C., 1622  
 PURI, A. N., 161  
 PURSELL, L., 1076  
 PY, G., 1810  
  
 RADOCHLA, R., 736  
 RAFKIND, I., 934, 935  
 RAGHAVACHARI, T. N. S., 1990, 1991  
 RAINEAU, M., 396  
 RAPP, W. M., 1600, 2185  
 RASMUSSEN, N. H., 1614  
 RAWLINS, C. S., 2169  
 RAY, T. B., 1599  
 RECORDER, R. F., 1834, 2173  
 REDDEN, R. E., 732  
 REINHOLD, F., 2001  
 REITH, J. F., 162  
 RENY, J. F., 1605  
 REYERSON, L. H., 1426  
 RIAL, W. P., 2181  
 RICE, O., 754  
 RICHARD, G., 1997  
 RICHARDSON, H. W., 153  
 RICHTER, C. P., 1978  
 RICKER, W. E., 1254  
 RIDLEY, C. E., 150  
 RIESBOL, H. S., 589  
 RISHWORTH, H. R., 411  
 RITCHIE, E. G., 1243  
 RITTER, O. K., 600  
 ROBERTS, E. B., 591  
 ROBERTS, L. B., 145  
 ROBIN, R. C., 1445  
 ROGERS, T. D., 1447  
 ROGERS, W. F., 601  
 ROHLER, S., 1261  
 ROSENBERG, M., 918, 919  
 ROTTMAYER, S. I., 1436  
 ROZENBLAT, M. M., 1986  
 RUBEY, W. W., 590  
 RUYS, A. C., 737  
  
 SAEGER, G. M., JR., 1597, 1995  
 SAGER, K., 1810  
 SALTER, G. S., 1239  
 SANDENBURGH, G. H., 403  
 SATTler, G., 1611  
 SAUNDERS, F., 914  
 SAVILLE, C. M., 148  
 SCHACKNE, G., 1239  
 SCHÄFER, A., 1449  
 SCHAPHORST, W. F., 1815, 2194  
  
 SCHELLENBERG, H., 1073  
 SCHLESINGER, G., 1248  
 SCHMIDT, B., 931  
 SCHMIDT, C., 596  
 SCHMIDT, R., 1421  
 SCHNEIDER, G. R., 735  
 SCHOELLER, H., 1422  
 SCHOEFFLE, O. F., 1813  
 SCHROEDER, 392  
 SCHUMANN, L., 162  
 SCHWARTZ, M. C., 1830  
 SCOTT, R. D., 1823  
 SEARS, H. H., 580  
 SEARS, W. H., 1435  
 SEDER, L. A., 1442  
 SEGNET, R. W., 395  
 SEMPLER, J., 1242  
 SEN, A. K., 145  
 SEYDEL, H., 1252  
 SHARPLEY, B. F., 152  
 SHAW, E. D., 1243  
 SHEEN, R. T., 1831  
 SHERMAN, C. W., 735  
 SHERMAN, H. R., 1063  
 SHERMAN, L. K., 1247  
 SHERWOOD, T. K., 1441, 1442  
 SHOCKLEY, H. G., 743  
 SHRYOCK, H. S., JR., 578  
 SHVEDOV, V. P., 1833  
 SIGWORTH, E. A., 1423  
 SIVERTS, S. A., JR., 930  
 SKAPSKI, A., 606  
 SKINNER, H. J., 1979  
 SKOPINTSEV, B. A., 164  
 SMALL, L., 2191  
 SMITH, A. V., 601  
 SMITH, C. W., 397  
 SMITH, E. E., 149, 1617  
 SMITH, E. F., 912  
 SMITH, F. E., 1992  
 SMITH, M. C., 606  
 SMITH, M. I., 1076, 1977  
 SNYDER, F. F., 1248  
 SÓS, J., 1076  
 SOSA, G., 1989  
 SOUTHERN, R., 1255  
 SPAULDING, C. H., 752  
 SPELLER, F. N., 597, 603  
 SPERRY, S. M., 1623  
 SPITTA, O., 912  
 STAIRMAND, C. J., 751  
 STANBURY, C. M., 741  
 STANLEY, W. W., 1083  
 STARLING, C. H., 755  
 STAS, M. E., 1983  
 STEELE, L. R., 2187  
 STEINBERG, I. H., 1445  
 STENE, S., 1827  
 STEWART, F. D., 140  
 STOHLMAN, E. F., 1076  
 STOKES, J. L., 916

- STRAUB, F. G., 1622  
 STRAUB, J., 1079  
 STRELE, G., 733  
 STRELL, M., 1977  
 STUNDL, K., 413  
 SUTER, R., 145  
 SUZUKI, S., 1079  
 SWANN, H. W., 408  
 SWEENEY, J. A., 405  
 SWEENEY, R. C., 2182  
  
 TANAY, I., 1830  
 TATLOCK, M. W., 2182  
 TAYLOR, D. R., 1598, 1996  
 TAYLOR, F. S., 1423  
 TAYLOR, J., 1985  
 TAYLOR, S. H., 147  
 TEMPEST, W. F., 2182  
 TEMPLE, F. C., 1061  
 THEARD, A. F., 1065  
 THIEBERGER, H., 162  
 THIELE, H., 1421  
 THOMAS, H. L., 2167  
 THOMAS, W. N., 157  
 THWAITES, F. T., 1057  
 TIEMERSMA-WICHERS, C. M., 1618  
 TILL, H. J., 1602  
 TITSLER, R. P., 914  
 TOBIN, A. J., 137  
 TODD, A. R., 749, 1621  
 TODT, F., 391  
 TÖRÖK, T., 1079  
 TOWLE, W. L., 1441, 1442  
 TRELLES, R. A., 1082, 1083  
 TREVOR, J. S., 410  
 TROSSBACH, D. G., 1249  
 TURNER, H. M., 1999  
 TURNER, S. E., 139  
 TYLER, C. R., 418  
 TYLER, R. G., 144  
  
 ULLRICH, F., 159  
 URBÁNYI, L., 164  
  
 VANCE, L. S., 922  
 VAN IJSSEL, J. J., 1983  
 VAN NES, B. A., 1816  
 VAN NORMAN, H. A., 2166  
 VAN POELGEEST, J., 927  
 VAN ROYEN, R. P., 598  
 VAN WYK, D. J., 1069  
 VATER, M., 582  
 VATKINA, S. G., 163  
 VEATCH, F. M., 753  
 VIBERT, A., 394, 1815  
 VILLEMARINE, 1993  
 VOEDISCH, F. W., 143  
 VOELTER, L. M. K., 1447  
 VOGT, H., 1071  
 VON FELLEBERG, T., 1983  
 VON FRANKENBURG, 406  
  
 WAGENAAR, W., 414  
 WAKSMAN, S. A., 916  
 WALDECK, K., 1620  
 WALL, T. S., 156  
 WALTHER, W., 751  
 WATERMAN, M. H., 575, 1434  
 WATJEN, A. E., 1602  
 WATSON, R. M., 581  
 WEART, J. C., 1981, 1993  
 WEIMANN, R., 1252  
 WEIR, P., 1612  
 WEIR, W. V., 1620, 2190  
 WELCH, W. A., 1426  
 WENGER, E., 1433, 1601  
 WESLEY, J. B., 1624  
 WESLY, 1624  
 WESTFALL, B. B., 1076  
 WEYMOUTH, F. E., 1430  
 WHITE, C. E., 1833  
 WHITE, C. M., 1245  
 WHITNEY, R. J., 1830, 1831  
 WHITSON, T. B., 1610  
 WHITWELL, J. C., 1448  
 WICHMANN, H. J., 1832, 1833  
 WILHELM, R. H., 1448  
 WILLIAMS, G. W. M., 1077  
 WILLIAMS, H. B., 1078  
 WILLIAMSON, J., 1438  
 WISELY, W. H., 595  
 WISHART, A. W., 1426  
 WISLICENUS, G. F., 581  
 WITHROW, J. R., 594  
 WITTMANN, H., 1449  
 WOHLFEIL, T., 738  
 WOLBER, J., 1423  
 WOLMAN, A., 1430  
 WOLPERT, N. N., 1064, 1605, 1606,  
 1606, 1995, 2169  
 WOOD, E. J. F., 414, 415, 1420  
 WOODS, F. W., 591  
 WORK, L. T., 1448  
 WORMWELL, F., 597  
 WORTHINGTON, E. B., 918  
 WRIGHT, C. P. F., 1243  
 WRIGHT, G. E., 2191  
 WRIGHT-SMITH, R. J., 1599  
 WROUGHTON, D. M., 1448  
 WUNDERLICH, W. E., 1252  
 WYATT, J. C., 1613  
 WYLLIE, J., 1808  
 WYMORE, H., 161  
  
 YOUNG, M., 1079  
 YOUNG, R. B., 158  
  
 ZHAKOVA, N. A., 600  
 ZIEGLER, N. R., 909  
 ZOBELL, C. E., 1984  
 ZOCH, R. T., 1247